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Advances in Obstetrics and Gynecology Research

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Application of Multimodal Analgesia Based on the ERAS Concept in Patients Undergoing Laparoscopic Surgery for Gynecological Tumors

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Abstract: *Objective:* The application effect of multimodal analgesia based on the enhanced recovery after surgery (ERAS) concept in patients undergoing laparoscopic surgery for gynecological tumors. *Methods:* 48 patients with laparoscopic surgery for gynecological tumors were included, selected from January to December 2022, and randomly divided into the control group and observation group, with 24 cases in each group, to compare the effects. *Results:* The pain scores at each time point in the observation group were lower than those in the control group, and the recovery time of analgesic gas and out-of-bed activity, and postoperative length of stay were shorter than those in the control group ($P < 0.05$). *Conclusion:* Laparoscopic technology brings benefits to patients with gynecological tumors, realizes minimally invasive treatment, and reduces damage, but postoperative pain is still a key factor affecting prognosis. Multimodal analgesia based on the concept of ERAS can play a significant role in relieving pain, which has an important impact on improving the physical and mental state of patients and accelerating postoperative recovery.

Keywords: Gynecologic tumors; Laparoscopic surgery; ERAS concept; Multimodal analgesia; Total satisfaction with analgesia

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1. Introduction

During the perioperative perio.d, enhanced recovery after surgery (ERAS) is a very important concept, which aims to minimize the physical and mental stress response of postoperative patients through a series of optimized treatment measures and create good conditions for rapid recovery [1-4]. Gynecological tumors such as uterine fibroids occur frequently in clinical practice. Surgical removal of tumor tissue is the key to cure. Especially after the popularization of laparoscopic technology, the advantages of minimally invasive surgery have been affirmed by more people, and patients' subjective willingness to choose is strong. Therefore, the number of laparoscopic surgeries for gynecological tumors has increased significantly in recent years [5,6]. But even though laparoscopic surgery has many promotional advantages worthy of everyone's recognition, the postoperative pain will inevitably lead to trauma, which is a source of physical and mental stress. Studies have shown that under the influence of multiple factors such as laparoscopic pneumoperitoneum, vaginal stump, uterus, and

accessory damage, patients have different degrees of postoperative pain perception, and women are sensitive to pain and cannot tolerate it. Postoperative pain may become an important factor hindering postoperative recovery. Therefore, for laparoscopic treatment of gynecological tumors, postoperative analgesia is very important [7,8]. The concept of ERAS is advanced in surgery, and multimodal analgesia under its guidance can exert a more powerful analgesic effect.

Oxycodone is a semi-synthetic opioid extracted from the alkaloid thebaine. It is a unique δ-opioid receptor (DOR) and κ-opioid receptor (KOR) agonist with low affinity. Its analgesic mechanism is quite special, as it acts on the central nervous system terminal cell membrane μ-opioid receptors (MOR) [9], reducing or blocking the transmission of C fibers to neurons in the dorsal horn of the spinal cord, thereby preventing or delaying pain, and may also exert an analgesic effect on visceral pain by acting on organs composed of smooth muscles through the KOR [10]. The drug has a strong analgesic effect, quick onset, long-acting time, small adverse reaction, and a unique strong analgesic effect on visceral pain.

In addition, with the development and application of visualization technology, real-time ultrasound guidance technology is adopted, the direction of needle insertion can be dynamically monitored, and the positions of blood vessels, nerves, muscles, and abdominal organs can be displayed to achieve precise positioning and improve the success rate and safety of blockade. Nerve block technology has been widely used. The purpose of peripheral nerve block is to block the conduction of surgical injury stimuli, avoid the formation of central nervous sensitization, and help prevent the occurrence of hyperalgesia and paresthesia [11]. The perfect analgesic effect can reduce the dosage of opioids during the operation, has little impact on the pathophysiology of the patient's system, and can reduce postoperative complications.

Based on this, 48 patients were included in this study to conduct a comparative analysis of the multimodal analgesic effect based on the concept of ERAS, as follows.

2. Materials and methods

2.1. General information

A total of 48 patients undergoing laparoscopic surgery for gynecological tumors were selected from January to December 2022 and randomly divided into the control group and the observation group, with 24 cases in each group. The patients in the two groups were 21–53 years old (42.15 ± 5.36) years old and 21–54 years old (42.24 ± 5.19) years old, body weight of 67.59 ± 5.23 kg and 67.48 ± 5.19 kg, anesthesia time of 70.25 ± 10.23 min and 70.19 ± 10.45 min, operation time of 63.58 ± 12.15 min and 64.01 ± 13.59 min, and VAS score grade I/II of 15/9 (62.50%/37.50%) and 14/10 (58.33%/ 41.67%), respectively. The difference between the two groups of data is insignificant ($P > 0.05$).

Inclusion criteria included: (1) visual analog scale (VAS) grade I~II; (2) complete general information; (3) informed research, signed informed consent accompanied by family members.

Exclusion criteria included: (1) operation time < 0.5h or > 2h; (2) conversion to laparotomy; (3) opioid or alcohol dependence; (4) liver and kidney dysfunction.

2.2 Methods

Routine analgesia group (control group): VAS scoring method was used to understand the pain severity of patients after the operation, and analgesic drugs and analgesic programs were selected according to needs.

Multimodal analgesia group based on the ERAS concept (observation group):

(1) Guided by the ERAS concept, a working group is established to be responsible for postoperative pain relief. Members come from various departments. They need to study the ERAS concept, the

latest technical knowledge, and normative requirements for pain management together. All members cooperate to improve postoperative pain relief management. Before the operation, patients need to be informed of the key content of ERAS multimodal analgesia, including perioperative pain management and postoperative rehabilitation process, to help patients grasp the advantages and disadvantages of each analgesic method, and to have an accurate understanding of the expected postoperative pain, so as to obtain the cooperation of patients and their families to promote the smooth progress of postoperative rehabilitation.

(2) Multimodal analgesia: 0.05 mg/kg midazolam + 0.3 mg/kg etomidate + 0.3 μg/kg sufentanil + 0.6 mg/kg rocuronium bromide is selected for anesthesia induction, followed by endotracheal intubation and intermittent positive pressure ventilation. After anesthesia induction, bilateral transversus abdominis plane block + rectus sheath block (0.25% ropivacaine 40 mL) was performed under the guidance of ultrasound. Remifentanil, propofol, and sevoflurane were used for maintenance of anesthesia, and the medication was adjusted according to the patient's vital signs and body movement response, and rocuronium bromide was selected as an additional anesthetic drug based on actual needs. Ten minutes before the end of the operation, 3 mg granisetron was selected + 0.1mg/kg oxycodone hydrochloride injection intravenously. The patient-controlled intravenous analgesia pump (PCIA) was connected after the endotracheal tube was removed, 100 μg sufentanil + 10 mg dezocine + 6 mg granisetron + 110 mL of 0.9% sodium chloride was given (total dose of 120 mL), according to 2.0 mL/h background dose, 1.0 mL/single dose, and 20 min lock-in time for analgesia.

(3) Pain care: The fluctuation of physical signs was strictly monitored and analyzed regularly. The VAS scoring method was used to understand the changes in the patient's pain level and determine whether the pain is within the tolerance range. To achieve the purpose of pain relief, the wound must be kept dry and clean, and the dressing should be updated in time if exudate or blood is found, so as to strengthen infection prevention.

2.3 Observation indicators

The observation indicators in this study included:

(1) Pain score: the VAS scoring method was chosen to evaluate the pain degree immediately after extubation, 4h, 8h, 12h, 24h after operation, etc. The score is between 0 and 10, and the high score indicated the degree of pain.

(2) Clinical indicators: recovery time of analgesic gas, recovery time of out-of-bed activity, postoperative length of stay.

(3) Negative emotion: sedation agitation scale (SAS) and standard deviation scores (SDS) were selected for investigation, and the lowest score indicated the least negative emotion.

(4) Analgesic satisfaction: A self-made questionnaire was used to conduct the survey. "0-59 points", "60-89 points", and "90-100 points" corresponded to dissatisfied, relatively satisfied, and satisfied, respectively. The sum of the last two items was added to obtain the total satisfaction rate.

2.4 Statistical methods

The SPSS20.0 statistical software was used to process data. The measurement data were represented by mean ± standard deviation (SD), and the *t*-test was used. Enumeration data were expressed in %, and the χ^2 test was used. $P < 0.05$ means the difference is statistically significant.

3. Results

3.1 Comparison of pain scores between the two groups

The pain scores at each time point in the observation group were lower than those in the control group ($P < 0.05$). See **Table 1**.

Table 1. Comparison of pain scores between the two groups (mean ± SD, points)

Group	Number of cases	Immediate extubation	4 hours after the operation	8 hours after the operation	12 hours after the operation	24 hours after the operation
Observation group	24	2.08 ± 0.49	3.12 ± 0.56	2.77 ± 0.85	2.64 ± 0.74	2.47 ± 0.54
Control group	24	3.88 ± 1.02	5.52 ± 0.41	4.13 ± 1.02	3.96 ± 1.02	3.73 ± 0.69
t		7.793	16.941	5.018	5.132	7.045
P		0.000	0.000	0.000	0.000	0.000

3.2. Comparison of clinical indicators between the two groups

The recovery of analgesic gas, recovery of getting out of bed, and hospitalization time in the observation group were shorter than those in the control group ($P < 0.05$). See **Table 2**.

Table 2. Comparison of clinical indicators between the two groups (mean ± SD)

Group	Number of cases	Recovery time of analgesic gas (h)	Recovery time of out-of-bed (h)	Postoperative length of stay (d)
Observation group	24	15.76 ± 3.25	17.33 ± 4.25	5.25 ± 1.34
Control group	24	24.47 ± 4.26	23.46 ± 4.69	6.70 ± 1.19
t		7.964	4.745	3.964
P		0.000	0.000	0.000

3.3 Comparing negative emotions between the two groups

The SAS and SDS scores of the observation group were lower than those of the control group, ($P < 0.05$). See **Table 3**.

Table 3. Comparison of negative emotions between the two groups (mean ± SD, points)

Group	Number of cases	SAS	SDS
Observation group	24	32.15 ± 5.36	32.26 ± 5.48
Control group	24	43.25 ± 5.69	43.54 ± 5.78
t		6.957	6.938
P		0.000	0.000

3.4 Comparing the satisfaction degree of analgesia between the two groups

The total satisfaction with analgesia in the observation group was higher than that in the control group ($P < 0.05$). See **Table 4**.

Table 4. Comparison of the satisfaction degree of analgesia between the two groups [n (%)]

Group	Number of cases	Satisfied	Relatively satisfied	Dissatisfied	Total satisfaction rate
Observation group	24	12 (50.00)	10 (41.67)	2 (8.33)	22 (91.67)
Control group	24	6 (25.00)	10 (41.67)	8 (33.33)	16 (66.67)
x^2		3.200	0.000	4.547	4.547
p		0.074	1.000	0.033	0.033

4. Discussion

Laparoscopic surgery is generally the first choice for gynecological tumors, and its small trauma creates a prerequisite for the rapid recovery of patients after surgery compared with open surgery. Numerous studies have confirmed that laparoscopic surgery does not have a significant difference in achievement as compared to open surgery. In addition to the curative effect, the pain is lighter and the postoperative scar is smaller [12,13]. One of the important reasons why patients who choose minimally invasive surgery in current clinical practice can be discharged sooner is that the degree of postoperative pain is less. However, the damage caused by surgical operations cannot be ignored. After the surgical anesthesia subsides, the pain will gradually return. The tissue and organ damage and incision caused by the operation will bring a certain amount of pain, regardless of the individual's sensitivity and tolerance to pain. The degree of acceptance is different. If the pain cannot be effectively relieved, severe pain will become an important incentive for the occurrence of adverse physical and mental stress reactions [14]. This will have an extremely adverse effect on postoperative rehabilitation. Therefore, it is clinically believed that after laparoscopic surgery for gynecological tumors, it is necessary to carry out reasonable and scientific management of postoperative pain. The concept of ERAS calls for a variety of optimized treatment measures to be focused on during the perioperative period in order to minimize or even directly avoid adverse physical and mental stress reactions after surgery, to maintain the patient's physical and mental state in a relatively stable and better state, and to create favorable conditions for rapid postoperative recovery [15,16]. The main points of the multimodal analgesic management based on the concept of ERAS included: (1) determine the unified standard of pain assessment, improve the health education for patients, assist patients to understand and cooperate with various analgesic measures, so that they can have accurate anticipation of pain; (2) PCIA is one of the important modes of patient-controlled analgesia, and its biggest advantage lies in its wide range of applications and more types of drugs available. However, it has also been reported that this method can not directly block the pain sensation at the surgical site when it acts on the central nervous system, and a higher concentration of analgesic drugs is required to achieve postoperative pain-free effects. Therefore, opioid dosage is required to be strictly controlled to avoid adverse effects on the whole body [17,18].

Among the 48 patients included in this study, the analysis found that the pain scores of the observation group at each time point were lower than those of the control group, the recovery time of analgesic gas, the recovery time of out-of-bed, and the hospitalization time were all shorter than those of the control group, and the SAS and SDS scores were lower than those of the control group, with a higher total satisfaction degree of analgesia ($P < 0.05$). It can be seen from the results that multimodal analgesia based on the ERAS concept can optimize the clinical indicators, strengthen the analgesic effect, improve the patient's mentality, and accelerate the recovery of the patient, with outstanding value.

In summary, laparoscopic technology brings benefits to patients with gynecological tumors, realizes

minimally invasive treatment, and reduces damage, yet postoperative pain is the key factor affecting prognosis, so it is essential to strengthen postoperative pain management. Multimodal analgesia based on the concept of ERAS can play a significant role in pain relief, improve the physical and mental state of patients, and create favorable conditions for rapid postoperative recovery.

Disclosure statement

The authors declare no conflicts of interest.

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Analysis of the Clinical Application Value of Colposcopy Biopsy in the Screening of Cervical Precancerous Lesions

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Abstract: *Objective:* To analyze the value of colposcopy biopsy in the screening of cervical precancerous lesions. *Methods:* 5,000 patients with suspected cervical precancerous lesions were used as samples. From January 2020 to December 2022, pathological examination and colposcopy biopsy were carried out, and the value of colposcopy biopsy was analyzed. *Results:* 1,503 cases were positive and 3,497 cases were negative by pathology, whereas 1,432 cases were positive and 3,568 cases were negative by colposcopy biopsy. The diagnostic sensitivity, specificity, and accuracy of colposcopy biopsy were 99.69%, 94.54%, and 97.78%, respectively. Cervicitis, CIN I grade, CIN II grade, CIN III grade, and cervical cancer had no statistical difference with the pathological examination ($P > 0.05$). *Conclusion:* The colposcopy biopsy scheme is used in the screening of cervical precancerous lesions, the detection accuracy is high in consistency with the pathological results, the risk of missed diagnosis and misdiagnosis is low, and it is efficient and feasible.

Keywords: Cervical cancer; Precancerous lesions; Colposcopy biopsy; Clinical value

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1. Introduction

Cervical cancer is a general term for malignant lesions in the cervical region, which is related to pathological tumors induced by uterine cavity cell lesions, and accounts for a relatively high proportion of gynecological reproductive tract malignancies [1]. The analysis of cervical cancer etiology showed that the human papillomavirus (HPV) infection is the main risk factor. At present, there is no definitive cure for cervical cancer, but vaccination and regular testing can be used to prevent and control cervical cancer, so as to diagnose and treat cervical precancerous lesions as early as possible and reduce the risk of cervical cancer [2]. Currently, clinical diagnosis is mostly based on the “three-step program”, such as cervical thin-layer liquid-based cytology screening, HPV screening, and colposcopy biopsy [3]. Among many detection schemes, colposcopy biopsy is safe and accurate and can be promoted as a screening scheme for cervical precancerous lesions. In this paper, 5000 patients with suspected cervical precancerous lesions were used as the study sample to explore the value of colposcopy biopsy.

2. Materials and methods

2.1. Information

Five thousand patients with suspected cervical precancerous lesions were recruited from January 2020 to December 2022. The patients aged between 28–72 years old, with an average of 50.17 ± 2.84 years old, had pregnancies of 1–4 times, with an average of 2.91 ± 0.41 times, had parities of 1–3 times, with an average of 1.67 ± 0.34 times.

2.2. Inclusion and exclusion criteria

The inclusion and exclusion criteria are as follows:

(1) Inclusion criteria: (i) all patients underwent colposcopy cervical biopsy in our hospital due to abnormal cervical liquid-based cytology (TCT) and/or high-risk positive human papillomavirus (HPV), or symptoms of irregular vaginal bleeding or contact bleeding; (ii) informed consent; and (iii) with sex life history.

(2) Exclusion criteria: (i) history of total hysterectomy; (ii) during pregnancy period; and (iii) having an acute inflammatory period of the reproductive system.

2.3. Methods

2.3.1. Inspection method

Before colposcopy biopsy, abnormalities were detected through routine gynecological examination in patients with suspected cervical precancerous lesions. Patients were instructed to empty their bladder and adjusted the lithotomy position of the bladder. The speculum was prepared with an appropriate amount of lubricant on its surface before being placed in the vaginal vault area of patients with cervical precancerous lesions, followed by the cervical discharge being completely removed, and the angle of the objective lens being adjusted to obtain a clear image. The shape, color, and blood vessels of the cervix were observed and recorded with a low-magnification lens, and a cotton ball dipped with 3% glacial acetic acid was applied evenly on the cervical area to record the color changes of the cervical blood vessels, epithelium, and other areas. For severe cases, the acetic acid was wiped every 3 minutes, and then the iodine tincture was prepared and applied evenly on the cervix according to the actual situation of the patient, followed by carrying out the iodine experiment. Changes such as punctate blood vessels, abnormal blood vessels, mosaic areas, and white epithelium were recorded, and pathological tissues were obtained for inspection.

2.3.2. Diagnostic criteria

The diagnostic criteria of this study are as follows:

(1) Cervical intraepithelial neoplasia (CIN): Mild cervical symptoms, no typical hyperplasia, abnormal cells accounted for 1/3, and enlarged nuclei, classified into CIN I grade; cervical symptoms are slightly severe, no typical hyperplasia, abnormal cells can be seen. The cells accounted for 2/3, and the nuclei were severely enlarged, the divisions were more, and the nature was disordered, which was included in CIN II; the cervical symptoms were severe, carcinoma in situ appeared, and the entire layer was abnormal cells, and it was included in CIN III.

(2) Colposcopy standard: during colposcopy biopsy, the diagnosis is usually made from the lesion distribution area (such as inside the transformation zone, inside the endocervical canal, outside the transformation zone, etc.), color, configuration (such as boundary, outline, etc.), and vascular structure. Different types included normal, low-grade squamous intraepithelial lesions (LSIL), high-grade

squamous intraepithelial lesions (HSIL), suspected or confirmed cancer, unsatisfactory colposcopy, and others. For patients with early-stage cervical cancer, colposcopic strong light irradiation showed the local tissue being lard-like or cloud-like color, surface collapse, capillary lumen dilation, abnormal proliferation of blood vessels, widening of vascular intervals, and capillary loss of normal branching leading to hairpin-like, club-like, or tadpole-like branching. A 3% acetic acid solution was prepared and applied to the surface, which gave rise to a surface appearing like cooked meat with glassy edema. The iodine staining test appeared negative.

2.4. Observation indicators

The pathological results of the control group were used to calculate the coincidence rate of colposcopy biopsy.

2.5. Statistical research

The data of patients with suspected cervical precancerous lesions were processed with SPSS 21.0 recorded the count data of cervical precancerous lesions and the x^2 test was used; mean ± standard deviation (SD) was shown as the measurement data of cervical precancerous lesions and the *t*-test was used. There is a statistical difference when $P < 0.05$.

3. Results

3.1. Analysis of colposcopy results

Table 1 showed that there are a total of 1,503 cases were positive and 3,497 cases were negative by pathology, whereas 1,432 cases were positive and 3,568 cases were negative by colposcopy biopsy.

Table 1. Comparison of colposcopy results and pathological results

Group	Pathologically positive	Pathological negative	Total
Positive colposcopy	1,421	11	1,432
Negative colposcopy	82	3,486	3,568
Total	1,503	3,497	5,000

3.2. Analysis of diagnostic efficacy

Compared with the pathological results, the diagnostic sensitivity, specificity, and accuracy of colposcopy biopsy were 99.69%., 94.54%, and 97.78%, respectively. The results were shown in **Table 2**.

Table 2. Diagnostic efficacy analysis

Inspection Method	Sensitivity	Specificity	Accuracy
Colposcopy	99.69% (3,486/3,497)	94.54% (1,421/1,503)	97.78% (4,889/5,000)

3.3. Detection situation analysis

Cervicitis, CIN I, CIN II, CIN III, and cervical cancer detected by colposcopy biopsy had no statistical difference with pathological examination ($P > 0.05$), as shown in **Table 3**.

Table 3. Detection analysis

Inspection Method	Cervicitis	LSIL (CIN I)	HSIL (CIN II, CIN III)	Cervical cancer
Pathological examination	3,497 (69.94%)	242 (4.84%)	1,136 (22.72%)	125 (2.50%)
Colposcopy biopsy	3,568 (71.36%)	233 (4.66%)	1,072 (21.44%)	127 (2.54%)
x^2	2.4311	0.1790	2.3807	0.0163
P	0.1190	0.6722	0.1228	0.8985

4. Discussion

Cervical cancer refers to cancerous lesions in the epithelium and glands of the cervix. It can be divided into different types such as cervical adenocarcinoma and squamous cell carcinoma, among which the risk of squamous cell carcinoma is higher [4]. Combined with the analysis of clinical practice, the common cause of cervical cancer is HPV infection, which is closely related to inflammatory stimulation in the cervical region, premature sex life, frequent sex life, poor eating habits, multiple pregnancies, and other factors [5]. There are no specific signs in the early stage of cervical cancer. Most patients are detected by screening. As cervical cancer progresses, patients may experience symptoms such as postmenopausal bleeding, irregular vaginal bleeding, and contact bleeding. Therefore, early detection of cervical precancerous lesions and timely treatment are extremely important [6]. Precancerous lesions of the cervix refer to cervical cells that have not broken through the basement membrane, and there is no problem of cancer infiltration, also known as intraepithelial neoplasia. Based on the analysis of the physiological and anatomical structure of the cervical epithelium, it belongs to the stratified squamous epithelial structure, mostly with 20–25 layers, and can be divided into CIN grades I–III according to the degree of cervical lesions [7]. Due to the close relationship between cervical precancerous lesions and HPV infection, if the patient is infected with HPV, cervical smear screening is required. If precancerous lesions are found, further colposcopy biopsy is required to make a clear diagnosis and treatment. Generally, doctors recommend conservative treatment for patients with CIN I with periodic reexamination; CIN II may regress or may progress to III, hence conservative treatment or cervical conization can be selected according to the patient's reproductive needs, age, and treatment willingness; CIN III is recommended for cervical conization treatment [8].

Currently, colposcopy biopsy is mostly used in clinical examinations for cervical cancer. A 6–20 magnification lens is used to observe the cervix and vaginal epithelial lesions. At the same time, a low-magnification magnifying glass is used to reflect the patient's vaginal condition on the fluorescent screen and subtle changes in the vagina are observed by rotating the vaginal speculum, which all have been widely used in gynecological examinations [9]. However, colposcopy cervical biopsy is an invasive examination, and it is also an important detection method to determine the location of cervical cancer and the cause of infection. It does not require anesthesia and can be completed in an outpatient clinic. For the actual colposcopy, it is essential to perform on the patient during the non-menstruation period, instruct the patient in the position of bladder lithotomy, guide and encourage the patient to relax, and then open the vagina to fully expose the cervix. If mucus is found in the cervical area, wipe the mucus clean to avoid mucus affecting the diagnosis [10]. After the doctor handles the cervical mucus, observe whether there is any abnormality in the cervical area, and then apply 5% acetic acid. If any abnormality is found, take a photo as evidence. Physicians comprehensively evaluate the most serious lesion area based on the test results, obtain pathological tissue for biopsy, and the pathologist interprets the test results [11]. If the examination results suggest that there are cervical precancerous lesions, it is essential to actively carry out diagnosis and treatment. In summary, colposcopy biopsy has the advantages

of less trauma and a high detection rate, which can alleviate female patients' taboo to seek medical treatment, and has a high application value. However, during the actual screening of cervical precancerous lesions, it is necessary to carefully observe the conditions of cervical lesions, avoid misdiagnosis and missed diagnosis as much as possible, and at the same time do a good job in the psychological construction of patients. Timely counseling of patients to appease their emotions is required to avoid medical disputes [12].

Combined with the data analysis in this paper, 1,503 cases were positive and 3,497 cases were negative in the pathological examination, whereas 1,432 cases were positive and 3,568 cases were negative in colposcopy biopsy. The diagnostic sensitivity, specificity, and accuracy of colposcopy biopsy were 99.69%, 94.54%, and 97.78%, respectively. There was no statistical difference in the coincidence rate of cervicitis, CIN I, CIN II, CIN III, and cervical cancer detected by colposcopy biopsy and pathological examination ($P > 0.05$). It is suggested that the consistency between colposcopy biopsy and pathological results is high, and it has high diagnostic efficiency in the screening of cervical precancerous lesions. Colposcopy biopsy is used in the screening of cervical precancerous lesions and has the following application values: (1) compared with routine re-examination, colposcopy biopsy is safer, with less pain for patients and a low rate of missed diagnosis; (2) colposcopy biopsy is an important method for screening cervical cancer, and the accuracy of biopsy is high; (3) colposcopy biopsy can detect subtle lesions in the cervical region and detect new lesions in time; (4) colposcopy biopsy can dynamically observe the lesions of reproductive organs, and at the same time keep accurate records, and can dynamically display the inspection process and inspection results; (5) colposcopy biopsy can accurately assess the condition of cervical lesions, and can be used as a basis for physicians to analyze the causes of cervical lesions; (6) colposcopy biopsy is suitable for early screening of cervical diseases, and can also be used for prognosis assessment of cervical cancer [13]. However, during the actual colposcopy biopsy, the following items should be focused on: (1) during the period before inserting the vaginal speculum, it should be expanded and inserted under direct vision to avoid cervical abrasion; (2) for suspected cervical precancerous lesions, pathological tissue should be taken for biopsy under the guidance of colposcopy; (3) during the examination, the cervical canal should be fully exposed to observe whether there is an inward shift in the transformation zone in order to avoid missed diagnosis as much as possible; (4) scientifically select the time of colposcopy biopsy to screen suspected CIN or cervical cancer lesions without special time requirements, for example, checks should be carried out during or near ovulation to screen cervical canal lesions, whereas it is recommended to have a clean menstrual period for 2 weeks completed within to screen other cervical lesions; (5) for patients with complicated conditions, colposcopy biopsy can be combined with cytology examination to reduce missed diagnosis [14].

To sum up, the colposcopy cervical biopsy program is used in the screening of cervical precancerous lesions, which can accurately assess the risk of precancerous lesions, and at the same time can assist physicians in clarifying the stage of precancerous lesions and guiding later symptomatic treatment, thereby reducing cervical cancer and other malignant events, with promotional value.

Disclosure statement

The authors declare no conflicts of interest.

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Effect of Vitamin E Supplemented with Calcium in the Treatment of Hypertension During Pregnancy on Maternal and Infant Outcomes

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Abstract: *Objective:* To investigate the effect of vitamin E supplemented with calcium in the treatment of hypertension during pregnancy on maternal and infant outcomes. *Methods:* 60 patients with gestational hypertension admitted from January 2020 to December 2022 were recruited and randomly divided into the control group and the observation group, each group including 30 patients. The control group was given routine treatment, whereas the observation group was given routine treatment combined with vitamin E-supplemented calcium therapy, and both groups received treatment until delivery. The clinical effects of the observation group and the control group after treatment, systolic and diastolic blood pressure, mean arterial pressure, urine protein, blood lipid levels at different time points (before and after treatment), and maternal and child outcomes during treatment were uniformly compared and analyzed. *Results:* After treatment, the total clinical effective rate (93.33%) of the observation group was significantly higher than that of the control group (70.00%); compared with before treatment, the systolic blood pressure, diastolic blood pressure, mean arterial pressure, urine protein, TC, and TG levels of the two groups were all lower after treatment, and the observation group was at a lower level; there was no significant difference in the incidence of hemorrhage ($P > 0.05$). *Conclusion:* Vitamin E supplemented with calcium has a significant effect on the treatment of hypertension during pregnancy, which can help reduce blood pressure and blood lipid levels, reduce urinary protein content, improve maternal and child outcomes, and improve safety.

Keywords: Hypertension during pregnancy; Vitamin E; Calcium supplements; Maternal and infant outcomes

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1. Introduction

Gestational hypertension is a disease unique to pregnancy. Patients may present with typical symptoms such as elevated blood volume, fatigue, and limb edema. If not treated promptly and effectively, it may pose a serious threat to the life and health of pregnant women and perinatal infants [1,2]. At present, clinical treatment mainly includes patient condition monitoring and conventional antihypertensive drugs. Among them, magnesium sulfate is a commonly used drug, which helps to improve blood circulation, and nifedipine can protect the myocardial tissue of the body. However, the above drugs have no significant antihypertensive effect on patients [3,4]. As a fat-soluble antioxidant, vitamin E is beneficial to inhibit the process of lipid oxidation. At the

same time, it is especially important to improve the abnormal state of calcium metabolism in the body when supplemented with calcium [5]. Based on this, the purpose of this study is to investigate the effect of vitamin E supplemented with calcium in the treatment of hypertension during pregnancy on maternal and fetal outcomes.

2. Materials and methods

2.1. General Information

The implementation of this study was approved by the medical ethics committee of the Nanjing Jiangbei Hospital. 60 patients with gestational hypertension admitted between January 2020 to December 2022 were recruited and divided into the control group and the observation group using the random number table method, each group including 30 patients. The gestational weeks of the patients in the control group ranged from 25 to 38 weeks, with an average of 30.15 ± 2.31 weeks; their age ranged from 22 to 38 years, with an average of 28.96 ± 2.11 years; 18 of them were primiparas and 12 were multiparas. The gestational weeks of the patients in the observation group ranged from 23 to 37 weeks, with an average of 29.12 ± 2.04 weeks; their age ranged from 24 to 39 years, with an average of 28.55 ± 2.18 years; 20 of them were primiparas and 10 were multiparas. The above-mentioned general data of the observation group and the control group were compared and showed no significant difference, hence, subsequent comparisons between different groups could be carried out. All patients and their family members signed the relevant supporting documents of informed consent. Diagnostic criteria were according to the relevant content in the "Guidelines for the Diagnosis and Treatment of Hypertensive Disorders During Pregnancy (2015)" [6]. Inclusion criteria included those who meet the above diagnostic criteria, those who have not taken antihypertensive drugs 30 days before inclusion in the study, and those who have no allergic reactions to the drugs used in this study. Exclusion criteria included those with a history of hypertension, those with mental disorders, and those with liver and kidney impairment.

2.2. Treatment methods

The patients in the control group were given routine treatment of 10 mg nifedipine sustained-release tablets (Hubei Yikang Pharmaceutical Factory, National Pharmaceutical Approval H20113545, specifications: 10 mg) orally 3 times per day, 25% magnesium sulfate (Tonghua Huaxia Pharmaceutical Co., Ltd., National Drug Approval H20045165, specification: 10 mL:1 g) mixed with 500 mL of 5% glucose injection and then intravenously infused once daily. The patients in the observation group received the same routine treatment as the control group and combined with 50 mg vitamin E tablets (China Resources Double Crane Pharmaceutical Co., Ltd., National Drug Approval H11021689, specification: 5 mg) orally 3 times per day, and 0.6 g calcium carbonate tablets (Wuhan Tongji Modern Medical Technology Co., Ltd., National Pharmaceutical Approval H42022521, specification: 0.3 g) orally once daily. Both groups received treatment until delivery.

2.3. Observation indicators

Observation indicators of this study included:

(1) Comparative analysis of the clinical efficacy of the two groups: after treatment, the evaluation was carried out according to the "Guidelines for the Diagnosis and Treatment of Hypertensive Disorders During Pregnancy (2015)". After treatment, the symptoms of chest tightness, headache, abdominal discomfort, and other symptoms disappeared, the blood pressure was normal, and the range of blood pressure index tends to be normal, it is effective, and it is ineffective if it fails to reach the above standard after treatment. "1- inefficiency" is the formula for calculating the total clinical effective rate.

(2) Comparative analysis of systolic blood pressure, diastolic blood pressure, mean arterial pressure, and

urinary protein levels between the two groups: the systolic blood pressure, diastolic blood pressure, and mean arterial pressure levels at different time points (before and after treatment) were measured with a sphygmomanometer, and 3 ml of urine was collected for 24 hours, and the urine protein levels of the two groups were detected by colorimetry.

(3) The blood lipid levels of the two groups were compared and analyzed. About 3 mL of fasting venous blood was collected from the two groups at different time points (before and after treatment), and centrifuged to prepare serum (3500 r/min, 15 min). The levels of total cholesterol (TC) and triacylglycerol (TG) were detected with an automatic biochemical analyzer.

(4) The maternal and fetal outcomes of the two groups were compared and analyzed, and the incidences of cesarean section, postpartum hemorrhage, neonatal asphyxia, and fetal distress were recorded and compared between the two groups during the treatment period.

2.4. Statistical methods

The calculation and analysis of the following data were carried out uniformly through SPSS 22.0 software. $P < 0.05$ suggests that the data difference is significant. The enumeration data involved are represented by numbers (n) and percentages (%), and the test method is x^2; the measurement data involved are represented by mean ± standard deviation (SD), and the test method is t.

3. Results

3.1. Comparative analysis of the clinical efficacy of the two groups

It can be found in **Table 1** that the total clinical effective rate (93.33%) of the observation group was significantly higher than that of the control group (70.00%) after treatment ($P < 0.05$).

Table 1. The clinical curative effect comparison of the observation and control groups [n (%)]

Group	Number of cases	Markedly effective	Effective	Ineffective	Total effective rate
Control group	30	8 (26.67)	13 (43.33)	9 (30.00)	21 (70.00)
Observation group	30	11 (36.67)	17 (56.67)	2 (6.67)	28 (93.33)
x^2 value					5.455
P value					0.020

3.2. Comparative analysis

The systolic blood pressure, diastolic blood pressure, mean arterial pressure, and urine protein levels of the two groups can be found in **Table 2**. Compared with before treatment, the systolic blood pressure, diastolic blood pressure, mean arterial pressure, and urine protein levels of the two groups of patients after treatment were all reduced, and the observation group was at a lower level ($P < 0.05$).

Table 2. Comparison of systolic blood pressure, diastolic blood pressure, mean arterial pressure, and urine protein level between the observation and the control groups before and after treatment (mean ± SD)

Group	Number of cases	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)		Mean arterial pressure (mmHg)		Urine protein (mg/24h)	
		Before	After	Before	After	Before	After	Before	After
Control group	30	151.44 ± 26.52	133.06 ± 20.19*	97.15 ± 8.44	84.20 ± 6.45*	127.49 ± 18.48	110.06 ± 16.52*	1,510.32 ± 133.20	810.56 ± 30.05*
Observation group	30	150.98 ± 27.46	121.45 ± 19.50*	96.98 ± 9.12	72.11 ± 5.97*	128.15 ± 19.20	100.41 ± 13.77*	1508.69 ± 130.89	548.77 ± 27.92*
t value		0.066	2.265	0.075	7.535	0.136	2.458	0.048	34.957
P value		0.948	0.027	0.941	< 0.001	0.893	0.017	0.962	< 0.001

3.3. Comparative analysis of blood lipid levels in the two groups

It can be found in **Table 3** that compared with before treatment, the levels of TC and TG in the two groups of patients decreased after treatment, and the observation group was at a lower level ($P < 0.05$).

Table 3. Comparison of blood lipid levels between the observation and the control groups before and after treatment (mean ± SD, mmol/L)

Group	Number of cases	TC		TG	
		Before treatment	After treatment	Before treatment	After treatment
Control group	30	5.91 ± 0.74	4.52 ± 0.57 *	8.96 ± 1.23	7.01 ± 1.02 *
Observation group	30	5.89 ± 0.81	4.01 ± 0.33 *	8.87 ± 1.35	6.25 ± 0.74 *
t -value		0.100	4.241	0.270	3.303
P value		0.921	<0.001	0.788	0.001

Compared with before treatment, * P <0.05.

3.4. Comparative analysis of maternal and child outcomes between the two groups

It can be found in **Table 4** that the incidence rates of cesarean section, neonatal asphyxia, and fetal distress in the observation group during the treatment period were all lower than those in the control group, $P < 0.05$ by statistical calculation; and there was no significant difference in the incidence of postpartum hemorrhage between the two groups ($P > 0.05$).

Table 4. Comparison of maternal and infant outcomes between the observation and the control groups during treatment [*n* (%)]

Group	Number of cases	Cesarean section	Postpartum hemorrhage	Neonatal asphyxia	Fetal distress
Control group	30	19 (63.33)	6 (20.00)	8 (26.67)	6 (20.00)
Observation group	30	11 (36.67)	1 (3.33)	1 (3.33)	0 (0.00)
x^2 value		4.267	2.588	4.706	4.630
P value		0.039	0.108	0.030	0.031

4. Discussion

Gestational hypertension refers to the first occurrence of diastolic blood pressure ≥ 90 mmHg and systolic blood pressure ≥ 140 mmHg after 20 weeks of gestation. Multiple pregnancy, advanced age, and previous preeclampsia are all risk factors for the onset. At present, the main purpose of clinical treatment for hypertensive patients during pregnancy is symptomatic treatment, alleviating the symptoms of patients, and then controlling the disease [7,8]. Conventional treatment is not effective in improving various maternal and child outcomes, and it is necessary to seek more effective treatment options to improve the prognosis of patients [9].

Studies have shown that the onset of hypertension during pregnancy is closely related to abnormal hemodynamics, calcium deficiency, and other factors [10]. Vitamin E can inhibit the peroxidation process of phospholipids, thereby reducing the degree of damage to vascular endothelial cells; in addition, calcium supplements can help correct the body's blood calcium imbalance, reduce the permeability of cell membranes, and inhibit the permeability of vascular smooth muscle cells, thereby reducing blood pressure. The combined application of the two can also reduce the leakage of body protein and reduce the content of urinary protein [11]. Through the analysis of the results of this study, it can be found that after treatment, compared with the control group, the clinical total effective rate of the observation group is at a higher level, and the systolic blood pressure, diastolic blood pressure, mean arterial pressure and urinary protein are all at a lower level, suggesting that the application of vitamin E supplemented with calcium in the treatment of hypertensive patients during pregnancy is beneficial to alleviate the clinical symptoms of patients, reduce blood pressure and urine protein content, and the effect is significant.

Hypertensive patients during pregnancy are often accompanied by lipid metabolism disorders and are in an abnormal state. The increase in blood lipid concentration can break the balance of oxidation and antioxidant status and increase the risk of acute atherosclerosis [12]. Exogenous vitamin E supplementation is beneficial to correct the above imbalance, inhibit oxidative stress, reduce toxic products, and improve blood lipid metabolism [13]. On the other hand, vitamin E and calcium supplements are beneficial to supplement nutrients, increase the flow level of red blood cells, improve the microcirculation perfusion of the uterus and placenta, correct the ischemia and hypoxia status of patients and fetuses, and improve adverse maternal and infant outcomes [14]. After analyzing the results of this study, it can be found that compared with the control group, the incidences of TC, TG after treatment and cesarean section, neonatal asphyxia, and fetal distress in the observation group were lower than those in the control group.

In summary, vitamin E supplemented with calcium has a significant effect on the treatment of hypertension during pregnancy, which can help reduce blood pressure and blood lipid levels, reduce urinary protein content, and improve maternal and child outcomes. It is worthy of clinical application and promotion.

Disclosure statement

The author declares no conflicts of interest.

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Research Progress on Pathogenesis and Treatment of Primary Dysmenorrhea

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Abstract: Primary dysmenorrhea is one of the common gynecological diseases of women of childbearing age, which can affect the work, study, and life of patients in severe cases. From the perspective of Western medicine, primary dysmenorrhea is caused by excessive secretion of prostaglandin and contraction of uterine smooth muscle, so the treatment focus of Western medicine is oral non-steroidal anti-inflammatory drugs or contraceptives, but its side effects cannot be ignored. From the perspective of Chinese medicine, primary dysmenorrhea is caused by qi-blood stagnation, so the focus of Chinese medication is dialectical treatment, which can improve qi-blood stagnation by acupuncture, decoction, moxibustion, etc., with fewer side effects and long-term clinical significance. The purpose of this paper is to analyze the relevant literature about the pathogenesis and treatment of primary dysmenorrhea in recent years, and to understand the research progress of primary dysmenorrhea in Western medicine and traditional Chinese medicine, so as to provide a reference for clinical treatment of primary dysmenorrhea.

Keywords: Primary dysmenorrhea; Pathogenesis; Treatment

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1. Dysmenorrhea

Dysmenorrhea refers to the pain and heaving in the lower abdomen of women before and after menstruation or during the menstrual period. Some patients may be accompanied by headache, dizziness, fatigue, backache, and in severe cases, nausea, vomiting, pallor, and even fainting [1]. It is divided into primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea (PD) refers to the pain that occurs during or before menstrual cramps, mainly in the lower abdomen, often accompanied by waist pain, abdominal or anal distension, and other discomfort symptoms, without pelvic organic lesions [2]. Secondary dysmenorrhea refers to menstrual abdominal pain caused by organic pathological changes in pelvic organs, such as endometriosis, adenomyosis, hysteromyoma, uterine malformation, and chronic pelvic inflammatory disease [3].

Primary dysmenorrhea is the most common gynecological disease among women of childbearing age. About 75% of women of childbearing age are troubled by primary dysmenorrhea, which seriously affects their

normal work, study, and life [3,4].

2. Pathogenesis of primary dysmenorrhea

2.1. Pathogenesis of primary dysmenorrhea in Western medicine

2.1.1. Prostaglandin (PG)

Western medicine believes that primary dysmenorrhea is caused by increased synthesis and release of prostaglandin in the endometrium [5]. Excessive release of prostaglandin leads to strong contraction of uterine smooth muscle and uterine blood vessels, and finally leads to endometrial ischemia and hypoxia, causing pain. Prostaglandins are derived from long-chain unsaturated fatty acids such as arachidonic acid. Arachidonic acid, a component of cell membrane phospholipids, is released from cell membrane phospholipids under the action of phospholipase (PLA2), and then metabolized into prostaglandin G2 (PGG2) and prostaglandin H2 (PGH2) under the action of cyclooxygenase (COX). The two can be further synthesized into prostaglandin F2α (PGF2α) and prostaglandin E2 (PGE2) under the action of different synthetases. PGFs synthesized and secreted by endometrium during non-pregnancy are mainly PGF2α and PGE2, which relaxes uterine smooth muscle and makes it contract. High concentration of PGF2α acts on the PGF2α receptor on the wall of spiral arteriole, causing spasmodic contraction of uterine smooth muscle, resulting in the decrease of uterine blood flow, uterine ischemia, uterine hypoxia, deposition of acid metabolites, and reduction of pain threshold of pelvic nerve endings to chemical and physical stimulation, which leads to dysmenorrhea [6-8]. In a mouse experiment conducted by Yu *et al.*, it was found that the serum PGF2α concentration of the dysmenorrhea mice model was significantly higher than that of the control group, and the serum PGF2α concentration of dysmenorrhea mice decreased after Chinese medicine treatment [9].

Another metabolic pathway of arachidonic acid is that under the action of 5-lipoxygenase, 5-hydroxytryptamine (5-HT) is generated, then leukotriene A4 is further synthesized, and finally leukotriene B4 and leukotriene C4 are synthesized. Among them, leukotriene C4, PGF2α, and PGE2 act together on the uterus, causing uterine smooth muscle contraction and vascular contraction, and pain (**Figure 1**) [10-13]. Liu *et al.* found that the content of 5-hydroxyindoleacetic acid (5-HIAA), the final product of 5-HT in dysmenorrhea model rats, was significantly higher than that in the control group, and the number and degree of body twisting were higher than that in the control group [14].

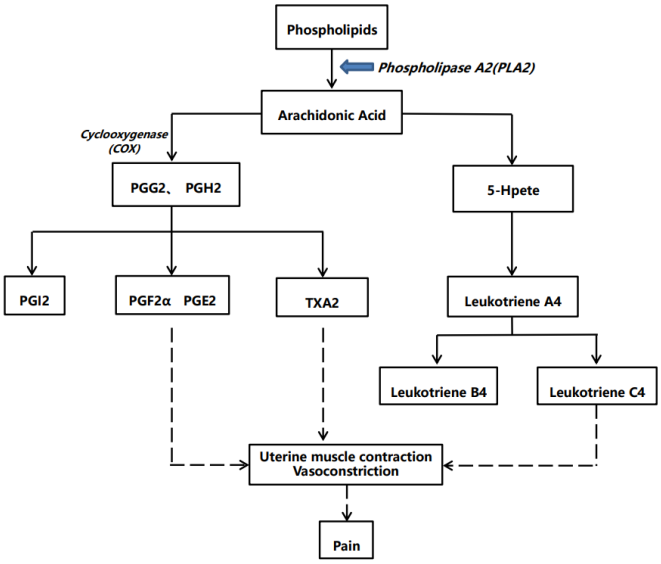


Figure 1. Prostaglandin synthesis process, pain-causing factors of dysmenorrhea.

2.1.2. Oxytocin (OT)

Oxytocin (OT) is the strongest uterine contractile agent known at present. When it binds to the oxytocin receptor (OTR), it can cause the contraction of the non-pregnant uterus. The content of OTR in the normal non-pregnant uterus is very small, but under pathological conditions, the stimulation of OT can make OTR highly expressed, increase the sensitivity of the uterus to OTR, and cause abnormal contraction of the uterus, leading to uterine ischemia and dysmenorrhea [15,16]. Oxytocin not only directly acts on uterine muscle cells to cause uterine contraction, but also stimulates endometrial cells to release PGF2α that causes dysmenorrhea, and the increase of PGF2α will stimulate the release of OT, forming a positive feedback cycle, which will jointly lead to uterine contraction and aggravate pain [17]. In addition, Liedman *et al.* confirmed that oxytocin plays a more important role in the non-pregnant uterus, especially in patients with dysmenorrhea [18].

2.1.3. Vasopressin (AVP)

In non-pregnant women, the effect of vasopressin (AVP) on uterine smooth muscle is much higher than oxytocin [19]. AVP acts on vasopressin receptors in the uterus, enhances myometrium activity, promotes uterine vasoconstriction, and makes the uterus ischemic, thus aggravating dysmenorrhea symptoms [20]; In addition, AVP directly promotes the production of PG, which causes uterine blood vessels to contract, resulting in decreased uterine blood flow and dysmenorrhea [21,22].

2.1.4. Others

The occurrence of primary dysmenorrhea is also related to estrogen, progesterone, Ca^{2+}, NO, etc. The level of PGF2α increased during dysmenorrhea, and the changes in prostaglandin were also related to the changes in estrogen and progesterone in the body. Due to uterine ischemia and hypoxia, the uterus will suffer from ischemia-reperfusion injury, and a large number of extracellular Ca^{2+} will enter the smooth muscle cells, resulting in intracellular Ca^{2+} overload, which will cause cell energy depletion and cell membrane damage. The uterine tissue cells will produce more oxygen free radicals to make the uterine smooth muscle spasm and cause dysmenorrhea [23,24]. It has been found that the content of NO in the uterus tissue of rats with primary dysmenorrhea increased and the content of Ca^{2+} decreased after treatment with traditional Chinese medicine, which inhibited the transmission of harmful information, which may be one of the mechanisms of treating primary dysmenorrhea [25].

2.2. Pathogenesis of primary dysmenorrhea in traditional Chinese medicine

Traditional Chinese medicine holds that “if obstructed, then painful,” and “if not vibrant, then painful.” Because of exogenous wind-cold, consuming cold diets, and living in cold places for a long time, it is easy to cause the cold pathogens to stagnate in the uterus, and blood stasis accumulates in the uterus, causing cold coagulation and blood stasis; Because of emotional depression and stagnation of *liver-qi*, *qi* movement is unfavorable, *chong* and *ren* are blocked, and blood circulation is not smooth, resulting in *qi* stagnation and blood stasis [26]. Overly hot constitution, improper recuperation during the menstrual period and postpartum, pathogenic damp-heat, and the stagnation of *qi* and blood will lead to the stagnation of damp-heat and blood stasis. The stagnation of *qi* and blood stasis, cold coagulation and blood stasis, and stagnation of damp-heat and blood stasis can all lead to stagnation of excess pathogen in *chong* and *ren* of the uterus and poor circulation of *qi* and blood, which fits the saying of “if obstructed, then painful” [27]. Deficiency of essence, deficiency of *kidney-qi*, excessive consumption of bad habits, long-term injury due to serious illness or early pregnancy and prolificacy, resulting in the deficiency of *kidney-qi*; The spleen loses its healthy movement, and the acquired source is insufficient, so it cannot nourish *Chong Ren* and uterus, resulting in *qi* and blood weakness [28]. The uterus is out of nourishment

due to the deficiency of *qi* and blood and a deficiency of *kidney-qi*, which fits the saying of "if not vibrant, then painful." There are many causes of dysmenorrhea, which are divided into deficiency and excess, such as cold coagulation, dampness resistance, blood stasis, and *qi* stagnation, deficiency is divided into *qi* deficiency and blood weakness, and there are also differences between liver, spleen and kidney deficiency. Due to physical differences, cold and heat coagulations are often mixed with deficiency and excess, which are mutually harmful [29-31]. The key to dysmenorrhea is "blood stasis." Primary dysmenorrhea can be divided into four types: *qi* stagnation and blood stasis, cold coagulation and blood stasis, *qi* and blood weakness, and liver and kidney loss, with cold-dampness stagnation being the most common type [32,33].

3. Treatment of primary dysmenorrhea

There are various treatment methods for primary dysmenorrhea. Because there are no organic pelvic lesions, its treatment principle is mainly to relieve pain and improve the quality of life of patients.

3.1. Western medicine treatment method

3.1.1. NSAIDs

Non-steroidal anti-inflammatory drugs (NSAIDs) are often used as first-line drugs for primary dysmenorrhea and are widely used in the world. Primary dysmenorrhea is characterized by excessive synthesis and release of prostaglandin in the endometrium, so blocking the COX pathway can reduce the synthesis and release of prostaglandin, thus reducing the contraction of the uterus and blood vessels and achieving the purpose of relieving pain [34]. However, due to its non-selectivity, it will damage the gastric mucosa and cause adverse reactions such as nausea, vomiting, and stomach discomfort. It is worth noting that arachidonic acid can not only synthesize prostaglandin through the COX pathway to cause dysmenorrhea but also produce leukotrienes through the 5-lipoxygenase pathway to cause pain, so some patients are not sensitive to NSAIDs because of the 5-lipoxygenase pathway [35].

3.1.2. Oral hormonal contraceptives

At present, hormonal contraceptives are recognized as the second-line drugs for primary dysmenorrhea, mainly by inhibiting ovulation and endometrial growth, or causing endometrial atrophy, reducing menstrual flow. It can also relieve primary dysmenorrhea by prolonging the menstrual cycle [13]. However, such drugs which may affect reproductive function should not be taken for a long time, especially for women who have fertility requirements [36].

3.1.3. Vitamin

Vitamin E can relieve primary dysmenorrhea, which is metabolized into tocopherol after entering the body. By regulating female estrogen, it can also inhibit the activities of phospholipase A2 and COX, thus inhibiting the production of prostaglandin, promoting the action of prostacyclin, dilating peripheral blood vessels, improving blood circulation, and alleviating female dysmenorrhea signs, thus playing a role in relieving dysmenorrhea [37]. Vitamin B1 supplementation can improve dysmenorrhea by reversing the common symptoms of vitamin B1 deficiency, such as muscle spasms, fatigue, and decreased pain tolerance. Vitamin B6 can promote the inflow of magnesium ions into cells, activate ATPase, consume a lot of ATP, and relieve dysmenorrhea [11].

3.1.4. Drugs for inhibiting uterine contraction

One of the characteristics of primary dysmenorrhea is the intense contraction of the uterus, so the purpose

of relieving pain can be achieved by inhibiting the contraction of smooth muscle. For example, calcium channel blockers (CCBs) can be used as a potential drug to treat primary dysmenorrhea. CCBs can prevent the release of calcium ions from cells, relax smooth muscle, dilate blood vessels, relieve uterine myometrium contraction spasm, and relieve pain [38]. In Li's research [39], Xintongding was used to treat patients with primary dysmenorrhea, and the effective rate was 76.6%.

3.1.5. Transcutaneous nerve electrical stimulation

It relieves pain through two mechanisms. The first is to send a series of afferent pulses through the large-diameter sensory fibers of the same nerve root, so as to increase the threshold of pain signals caused by uterine hypoxia and high contraction, thereby reducing pain perception. The second mechanism is that peripheral nerves and the spinal cord stimulate the release of endorphins, which provides another way of partial pain attenuation. This may be another option for women with contraindications to NSAIDs and their efficacy [11,40].

3.1.6. Surgery

Only a small number of patients with severe dysmenorrhea are ineffective in drug treatment, so they can choose surgical treatment and remove the uterosacral nerve. In Chen and Soong's clinical study [41], the pain relief rate of patients with primary dysmenorrhea after laparoscopic resection of the uterine presacral nerve was 77.1%, and severe cases could choose to remove the uterus [34].

3.1.7. Others

In addition to medical treatment and surgical treatment, environmental pain can be achieved by improving lifestyle, having a healthy diet, and local hot compress. Having a healthy lifestyle and good eating habits, exercising properly, and strengthening physical fitness, as well as choosing a local hot compress or massage to promote blood circulation and vasodilation when the pain is severe can relieve the pain [11,40].

3.2. Traditional Chinese medicine treatment method

3.2.1. Acupuncture

Acupuncture is one of the most commonly used methods to treat primary dysmenorrhea at present, and there are many acupoints to choose from, such as Guanyuan, Zhongji, Qihai, Xuehai, and Sanyinjiao [42]. In Guo's research [43], 180 patients with primary dysmenorrhea were investigated, and randomized controlled trials were conducted, in which the control group was treated with traditional Chinese medicine. The treatment group was treated by acupuncture with Shu Mu acupoints. Ganshu, Shenshu, Qihaishu, Guanyuanshu, Cixiu, Qimen, Guanyuan, Zhongji, Qihai, and Sanyinjiao acupoints were selected for three menstrual cycles. Finally, compared with the control group, the contents of serum PGF2α, of β-endorphin (β-EP) and the improvement of uterine blood flow in the treatment group were statistically significant ($P < 0.05$), which proved that acupuncture at Shumu acupoints can effectively treat primary dysmenorrhea by reducing serum PGF2α, increasing the content of β-EP and improving the hemorheology of patients' uterus. In a study by Lin *et al.* [44], 60 patients with primary dysmenorrhea were randomly divided into an acupuncture group and a control group. The acupuncture group selected Guanyuan, Sanyinjiao, and Diji acupoints, while the control group took painkillers and monitored the serum PGF2α content. The results confirmed that there was a significant difference in the serum PGF2α content between the acupuncture group and the oral painkiller group ($P < 0.05$), and its mechanism may be related to reducing the level of prostaglandin PGF2α in patients' menstrual blood. Tang and Liu randomly divided 60 patients with primary dysmenorrhea into an acupuncture treatment group and an oral Western medicine control group and found that acupuncture treatment had a more obvious effect on patients with primary dysmenorrhea [45].

In addition to ordinary acupuncture therapy, a new acupuncture therapy-buccal acupuncture therapy has appeared in recent years. Professor Wang Yongzhou's team found that there was a miniature holographic system on the face. Animal experiments proved that buccal acupuncture could relieve pain from the central nervous system by increasing the content of β-EP in cerebrospinal fluid and inhibiting the release of cholecystokinin octapeptide (CCK-8) [46,47]. According to the foregoing study, common acupuncture can achieve the purpose of relieving dysmenorrhea by acupuncture at different acupoints, such as Guanyuan, Sanyinjiao, Xuehai, and Qihai. These mechanisms are also based on the theory of Big Triple Jiao, so it can be speculated that dysmenorrhea can also be treated by acupuncture at the corresponding acupoints on the cheek.

In Guan's research [48], the research object is patients with dysmenorrhea caused by endometriosis, and the acupoints of the waist, sacrum, and lower jiao are selected, and then the acupoints are added according to the abdominal physical examination. Buccal acupuncture has been used for three menstrual cycles, and statistical difference analysis between the visual analog scale (VAS) before and after treatment was carried out. It is concluded that after three menstrual cycles of buccal acupuncture treatment, the patients' pain symptoms have been effectively alleviated, and the VAS has decreased significantly. This study proves that buccal acupuncture therapy is effective in treating dysmenorrhea and has long-term clinical significance. This provides a basis for the clinical treatment of primary dysmenorrhea with buccal acupuncture.

In clinical research by Li *et al.* [2], the patients with moderate and severe primary dysmenorrhea were randomly assigned by selecting the acupoints of the waist, sacrum, and lower jiao for buccal acupuncture treatment, and the buccal acupuncture treatment was compared with oral painkillers to observe whether the differences in VAS, dysmenorrhea symptom score and health survey brief form between the two groups before and after treatment were statistically significant. It is finalized that the VAS scores and other items in the two groups decreased compared with those before treatment, and the difference between the two groups was statistically significant after the treatment ($P < 0.05$). Buccal acupuncture can effectively relieve the clinical symptoms of moderate and severe primary dysmenorrhea, alleviate the symptoms associated with good dysmenorrhea and improve the quality of life.

3.2.2. Traditional Chinese medicine decoction

The most classic therapy of Chinese medicine is Chinese medicine decoction, which has been passed down since ancient times. Yuan *et al.* used Shaofu Zhuyu decoction to treat patients with primary dysmenorrhea [49]. According to Wang *et al.* [50], acupoint application of traditional Chinese medicine based on Jinkui Wenjing decoction has a significant effect on treating primary dysmenorrhea of cold coagulation and blood stasis type, which can effectively improve the symptoms of menstrual abdominal pain and improve the quality of life of patients and is suitable for popularization among students and even wider groups. In Zhao's research [51], the observation group was treated with modified Shaoyao Gancao decoction, and its overall effective rate and VAS score were significantly better than those of the control group ($P < 0.05$). It shows that the modified Shaoyao Gancao decoction can improve the clinical efficacy of primary dysmenorrhea and relieve the pain of patients. In Wang and Shi's clinical research [52], Wenjing Huayu decoction combined with Guizhi Fuling capsule has an obvious analgesic effect on patients with primary dysmenorrhea, and its mechanism may be related to regulating the expression of PGF2α and PGE2 in serum, and the medication safety is high.

3.2.3. Moxibustion

Moxibustion has a penetrating and diffusing effect. Through the stimulation of nerve endings and the conduction of the nervous system, it can promote local and systemic effects on the body, promote changes in nerves, endocrine, immunity, and metabolism, and relieve dysmenorrhea. Liao *et al.* [53], as well as Liu and

Wang [54], found that moxibustion at Shenque acupoint combined with warm acupuncture at Guanyuan and Sanyinjiao acupoints has a better clinical effect than warm acupuncture at Guanyuan and Sanyinjiao acupoints alone, and is safe and reliable, which is worthy of clinical reference. The studies from Li, Ma, and Wei [55], as well as Hou and Zhang [56], also concluded that although both the ibuprofen group and the moxibustion group can improve VAS, shorten the duration of dysmenorrhea, and reduce the severity of dysmenorrhea, the moxibustion group has more advantages, can achieve better clinical efficacy in treating primary dysmenorrhea, and the recurrence rate of dysmenorrhea is lower.

4. Summary

Primary dysmenorrhea affects patients' daily life. In the exploration of the pathogenesis and treatment of primary dysmenorrhea, modern medicine believes that primary dysmenorrhea is caused by excessive secretion of prostaglandin and excessive contraction of uterine smooth muscle. The focus of treatment is oral non-steroidal anti-inflammatory drugs or contraceptives, but there are many side effects, so the use of medication should be cautious. From the perspective of traditional Chinese medicine, primary dysmenorrhea is caused by *qi* and blood stagnation, so the focus of traditional Chinese medicine treatment is dialectical, which emphasizes the overall concept and adopts milder methods for treatment, which has long-term significance despite requiring some time to take effect. In addition, the new buccal acupuncture therapy in recent years may provide a new direction for the treatment of primary dysmenorrhea. Therefore, if primary dysmenorrhea is treated by combining traditional Chinese and Western medicine, it can not only fully display the characteristics of traditional Chinese medicine, but also absorb the advanced modern medical experience, which has broad development prospects.

Author contributions

Ma H is responsible for data acquisition, analysis, and paper writing. Li L and Wang G are responsible for writing ideas and revising opinions of the paper. Zhang B, Chen J, and Yuan S participated in data collection and screening, and put forward opinions on the revision of the paper in time. Sun Y has contributed to project design and analysis and is one of the corresponding authors. All authors made great contributions to this article.

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Disclosure statement

The authors declare no conflict of interest.

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Observation on the Effect of Individualized Nutrition Combined with Exercise Therapy for Pregnant Women with Gestational Diabetes Mellitus

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Abstract: *Objective:* To analyze the effect of individualized nutrition combined with exercise therapy for pregnant women with gestational diabetes mellitus. *Methods:* From March 2021 to March 2023, 100 pregnant women with gestational diabetes in our hospital were randomly divided into a control group and an observation group (50 cases in each group). The control group received routine nursing care, and the observation group received individualized nutrition and exercise therapy, and the intervention effects of the two groups were compared. *Results:* The fasting, 2-hour postprandial blood glucose, and glycosylated hemoglobin of the observation group were lower than those of the control group; the weight gain of each time period during pregnancy was lower than that of the control group; the incidence of adverse pregnancy events was lower than that of the control group; the quality-of-life score was higher than that of the control group ($P < 0.05$). *Conclusion:* Among pregnant women with gestational diabetes, individualized nutrition, and exercise therapy intervention can improve their blood sugar indicators, help control their weight during pregnancy, prevent adverse pregnancy events, and significantly improve their quality of life.

Keywords: Gestational diabetes mellitus; Individualized nutrition; Exercise therapy; Blood sugar index; Body weight

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1. Introduction

Gestational diabetes mellitus is a disease unique to pregnancy, and its occurrence is mainly related to changes in eating and living habits [1]. After the disease occurs, the blood sugar of the patient will rise. If it is not effectively controlled, it will even make the blood sugar level higher and cause great harm to the fetus. In severe cases, it will cause premature birth, miscarriage, postpartum hemorrhage, fetal distress, and other adverse consequences [2]. Therefore, it is necessary to early intervene in pregnant women with gestational diabetes, reasonably control the blood sugar indicators in the body, and cooperate with relevant clinical interventions while applying drugs, so as to ensure the health of pregnant women and promote the healthy development of fetuses [3,4]. Studies in recent years have shown that the occurrence of gestational diabetes is

closely related to body weight, lifestyle, and diet. Therefore, when interfering with pregnant women, attention should be paid to their exercise and nutritional guidance [5]. Based on this, this article will analyze and study the effect of individualized nutrition and exercise therapy, aiming to explore its significance on gestational diabetes, and the details are as follows.

2. Materials and methods

2.1. General information

A total of 100 pregnant women with gestational diabetes in our hospital from March 2021 to March 2023 were recruited and randomly divided into a control group and an observation group. The control group consisted of 50 cases with the age of 22–37 (27.15 ± 2.14) years old and pregnancy time of 20–32 (28.59 ± 1.20) weeks. The observation group consisted of 50 cases with the age of 22–38 (27.21 ± 2.20) years old and pregnancy time of 20–33 (28.61 ± 1.18) weeks. The data comparison between groups was insignificant ($P > 0.05$).

2.2. Inclusion and exclusion criteria

Inclusion criteria included: (1) pregnant women who are diagnosed with gestational diabetes; (2) pregnant women who are aged between 40 and 20 years old; and (3) pregnant women who or whose family members are aware of the study and signed the consent form.

Exclusion criteria included: (1) pregnant women with multiple pregnancies; (2) pregnant women with diabetes before pregnancy; and (3) pregnant women with mental and intellectual impairment.

2.3. Methods

2.3.1. Control group

The control group received routine nursing care, blood sugar control as directed by the doctor, rational use of drugs, and were informed to pay attention to diet control, limit the intake of sugary foods, pay more attention to rest, avoid overeating, work and rest regularly, take more walks and exercise more every day.

2.3.2. Observation group

The observation group was given individual nutrition and exercise therapy, as follows:

(1) Individualized nutritional intervention: (i) During the pre-pregnancy examination, the real situation of the patients was determined, and the daily calorie needs of the pregnant woman were calculated based on their gestational age, fetal status, weight, body weight, etc., followed by referring to the GDM diet guidelines, formulated individualized dietary plans for them, and urged pregnant women to strictly abide by them; (ii) According to the pre-pregnancy examination results of each period, the blood sugar of pregnant women was evaluated, and the diet of pregnant women was adjusted appropriately according to the principle of small portion and frequent meals. Also, attention is required to controlling the amount of edible salt, supplement potassium, calcium, and other elements, and more vegetables such as celery and leeks are encouraged during the period; (iii) Pregnant women were instructed to accurately fill in the diet plan, reminded to write the three meals and extra meals correctly, checked the diet plan from time to time, and corrected the inaccuracies, so as to ensure that pregnant women have a reasonable and scientific diet; (iv) The calories needed for pregnant women's weight were calculated, and the nutritional mix of three meals followed the calories needed for each time period. For example, 10% of calculated calories in the morning, 30% of calculated calories at noon, and 30% of calculated calories in the evening, and maintaining around 10% of calculated

calories for three meals plus meals; (v) The dietary nutrition comparison table was distributed to pregnant women so that they can use it as a reference for nutritional supplements every day to ensure that the fetus gets good development.

(2) Exercise therapy: According to the physical characteristics of pregnant women, after a comprehensive evaluation, corresponding exercise interventions are carried out. The main sports items are walking, yoga, dancing, and other exercises. Dancing can improve blood circulation in pregnant women but jumping and rotating are inadvisable during the dance to avoid accidents, and gentle aerobic dance is highly recommended. At the same time, walking can also be used to relieve the discomfort of some body functions during pregnancy. Walking can improve heart and lung function and promote blood circulation. Compared with other exercise methods, walking is also the safest kind. In the process of walking, pregnant women can also feel the fresh air outside, and the range of activities is wider, which helps to relax the mood, and is also an effective way to prevent and alleviate the adverse psychological conditions of pregnant women with gestational diabetes. Yoga exercise also has more advantages, however, specific yoga is chosen for pregnant women, and it needs to be distinguished from conventional yoga. Through yoga, the body's blood circulation can be sped up, enhancing the body's immunity and flexibility. However, attention should be paid when doing physical exercise, and pregnant women are required to wear some loose clothes, so as not to affect the blood circulation of the body if the clothes are too tight. During exercise, it is also necessary to limit the time to 30–40 minutes, and it must be done within 30 minutes after eating, which can improve the sensitivity of insulin, so as to achieve the control of blood sugar in the body.

2.4. Observation indicators

The observation indicators of this study are as follows:

(1) Observe the blood glucose indicators of the two groups, and detect them with a portable blood glucose detector, including fasting, 2-hour postprandial blood glucose, and glycosylated hemoglobin.

(2) Record the weight gain of the two groups at each time period during pregnancy, including weekly weight gain, total weight gain, weekly BMI gain, and total BMI gain.

(3) The adverse pregnancy events of the two groups were counted.

(4) Use the SF-36 scale to score the quality of life of the two groups. The higher the score is, the better the quality of life is.

2.5. Statistical methods

Statistical software SPSS 22.0 was used to analyze and process the data. The measurement data (mean ± standard deviation) and count data (%) were tested by t and x^2 tests, respectively, and the difference was considered statistically significant when $P < 0.05$.

3. Results

3.1. Blood glucose indicators of the two groups

Fasting, 2-hour postprandial blood glucose, and glycosylated hemoglobin in the observation group were lower than those in the control group ($P < 0.05$). See **Table 1** for details.

Table 1. Blood glucose indexes of the two groups before and after intervention (mean ± SD)

Group	Fasting blood glucose (mmol/L)		2 hours postprandial blood glucose (mmol/L)		Glycated hemoglobin(%)	
	Before	After	Before	After	Before	After
Control group (n = 50)	5.52 ± 0.51	4.65 ± 0.52	10.26 ± 1.48	7.05 ± 0.58	9.26 ± 0.51	5.78 ± 0.52
Observation group (n = 50)	5.50 ± 0.50	4.11 ± 0.10	10.15 ± 1.39	6.54 ± 0.21	9.28 ± 0.50	5.21 ± 0.15
t	0.152	5.926	0.154	2.658	0.162	2.654
P	0.589	0.000	0.526	0.000	0.485	0.000

3.2. Weight gain of the two groups at each time period during pregnancy

The weight gain of the observation group at each time period during pregnancy was lower than that of the control group (P <0.05). See **Table 2** for details.

Table 2. The weight gain of the two groups at each time period during pregnancy (mean ± SD)

Group	Weight gain per week (kg)	Total weight gain (kg)	Weekly BMI increase (kg/m²)	Total BMI increase (kg/m²)
Control group (n = 50)	0.42 ± 0.12	16.26 ± 4.52	0.17 ± 0.06	6.25 ± 1.95
Observation group (n = 50)	0.32 ± 0.05	13.20 ± 1.50	0.12 ± 0.01	5.15 ± 0.52
t	1.654	7.485	1.525	2.165
P	0.000	0.000	0.000	0.000

3.3. Adverse pregnancy events in the two groups

The incidence of adverse pregnancy events in the observation group was lower than that in the control group (P < 0.05). See **Table 3** for details.

Table 3. Adverse pregnancy events in the two groups [n (%)]

Group	Neonatal distress	Macrosomia	Premature infant	Neonatal hyperbilirubinemia	Total incidence
Control group (n = 50)	3 (6.00)	1 (2.00)	2 (4.00)	3 (6.00)	9 (18.00)
Observation group (n = 50)	1 (2.00)	0 (0.00)	0 (0.00)	1 (2.00)	2 (4.00)
x^2	1.042	1.010	2.041	1.042	5.005
P	0.307	0.315	0.153	0.307	0.025

3.4. The quality of life of the two groups

The quality of life score of the observation group was higher than that of the control group (P < 0.05). See **Table 4** for details.

Table 4. The quality of life of the two groups before and after intervention (mean ± SD)

Group	Vitality (points)		Physiological functions (points)		Emotional function (points)		Social function (points)	
	Before	After	Before	After	Before	After	Before	After
Control group (n = 50)	52.64 ± 8.14	61.36 ± 8.51	53.29 ± 8.45	60.45 ± 8.29	52.36 ± 8.45	62.68 ± 8.45	53.28 ± 8.41	63.40 ± 8.28
Observation group (n = 50)	52.81 ± 8.20	72.41 ± 3.15	54.50 ± 8.36	73.41 ± 3.15	51.48 ± 8.28	75.74 ± 3.20	53.45 ± 8.32	74.45 ± 3.20
t	0.162	9.825	0.284	8.595	0.281	8.265	0.084	9.265
P	0.784	0.000	0.968	0.000	0.785	0.000	0.752	0.000

4. Discussion

During pregnancy, due to changes in body hormones, both diet and living habits also change, so the number of complications will gradually increase [6,7]. Among them, gestational diabetes mellitus is the most common complication during pregnancy. If the blood sugar of pregnant women remains at a high level, it will cause various serious consequences, and even lead to ketosis [8,9]. For gestational diabetes, if the blood sugar of pregnant women continues to rise and the control effect is not good, various adverse pregnancy events will also occur, which will also have a serious impact on the healthy development of the fetus [10,11] Therefore, it is particularly necessary to implement the treatment and intervention of gestational diabetes mellitus.

According to relevant clinical data, effective control of blood sugar in pregnant women with gestational diabetes can ensure the normal development of newborns and also ensure the health and safety of pregnant women [12,13]. Therefore, clinically, it is not only necessary to effectively treat pregnant women with gestational diabetes but also to take good care of them [14]. The development of an individualized nutrition plan can provide dietary guidance to pregnant women with reference to the dietary standards recommended abroad, so as to achieve the purpose of standardizing dietary behavior [15,16]. In exercise therapy, exercise guidance for pregnant women can be strengthened, the amount of exercise can be increased, and blood sugar can be adjusted through exercise to improve blood sugar status [17,18]. In addition, exercise therapy can effectively promote the development of large muscle groups in pregnant women, thereby improving their physical functions and promoting production [19,20]. In this paper, pregnant women in the observation group were combined with individualized nutrition and exercise therapy. Compared with routine care, under this combined intervention, pregnant women had lower blood sugar indicators, less weight gain during pregnancy, fewer adverse pregnancy events, and improved quality of life.

To sum up, the effect of individualized nutrition combined with exercise therapy is remarkable, and it is significant for pregnant women with gestational diabetes.

Disclosure statement

The author declares no conflict of interest.

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Study on the Efficacy of Low-Dose Mifepristone in the Treatment of Endometriosis

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Abstract: *Objective:* To explore and analyze the efficacy of low-dose mifepristone in the treatment of endometriosis. *Methods:* 56 patients with endometriosis who were diagnosed and treated in the gynecology department of the People's Hospital of Danyang between August 2020 to December 2022 were recruited and divided into the study group (n = 28) and control group (n = 28). The study group was treated with low-dose mifepristone, and the control group was treated with regular-dose mifepristone. The effective rate of medication, hormone levels, bone density, and adverse reactions were compared between the groups. *Results:* There was a statistically significant difference ($P < 0.05$) in the effective rates of medication between the study group and the control group. Before treatment, the hormone levels were not statistically significant between the groups ($P > 0.05$); after treatment, the hormone levels in the study group were significantly better than those in the control group ($P < 0.05$). Before treatment, there was no significant difference in bone mineral density between the groups ($P > 0.05$); after treatment, bone density in the study group was higher than that in the control group ($P < 0.05$). The incidence of adverse reactions in the study group was significantly lower than that in the control group ($P < 0.05$). *Conclusion:* Low-dose mifepristone has a significant curative effect in the treatment of endometriosis, the hormone level and bone density are better, and there are few adverse drug reactions. This treatment is worthy of widespread promotion and application.

Keywords: Low-dose mifepristone; Endometriosis; Treatment

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1. Introduction

Endometriosis (EMT) is a disease caused by the growth of endometrial tissue in an abnormal position [1]. The ectopic endometrium usually invades the pelvic organs, the most common sites are the ovaries, and the main symptom is progressively aggravated secondary dysmenorrhea [2]. Mifepristone is a drug used to terminate embryonic development and can guide decidual shedding. After entering the body, the drug can combine with progesterone to stop the growth of the endometrium [3]. There is some ambiguity in the use of mifepristone. It has been reported in the literature that low-dose mifepristone has a better curative effect and safety can be controlled [4]. This article aims to study and analyze the efficacy of low-dose mifepristone in the treatment of endometriosis.

2. Materials and methods

2.1. General information

56 patients with endometriosis who were diagnosed and treated in the gynecology department of the People's Hospital of Danyang between August 2020 to December 2022 were recruited and divided into the study group (n = 28) and the control group (n = 28). The age of the study group was between 22 and 31 years old with an average age of 26.14 ± 1.27 years old, the menstrual cycle was 23 to 32 days with an average of 27.21 ± 1.36 days, the number of menstrual days was 3 to 7 days with an average of 5.01 ± 0.33 days. The control group was between 23 and 31 years old with an average age of 26.22 ± 1.29 years old; the menstrual cycle was 22 to 32 days and the average menstrual cycle was 27.52 ± 1.32 days; menstrual days were 4 to 7 days with an average of 5.21 ± 0.27 days. The comparison of general information showed no statistical significance ($P > 0.05$).

Inclusion criteria included: (1) Patients who meet the diagnosis of endometriosis; (2) Patients with informed consent; (3) The patient was treated with mifepristone for the first time; and (4) Patients with good compliance.

Exclusion criteria included: (1) Patients with malignant tumors; (2) Patients with blood system diseases; and (3) Patients with mental illness.

2.2. Methods

The control group was treated with conventional doses of mifepristone (12.5 mg), administered on the 5th day of menstrual cramps, and continued for 6 months.

The study group received low-dose mifepristone treatment (6.25 mg), administered on the 5th day of menstrual cramps, and continued for 6 months.

2.3. Observation indicators

The observation indicators of this study included:

(1) Compare the effectiveness of medication between groups, including markedly effective (no symptoms and signs), effective (mild symptoms and signs), and ineffective (no improvement in symptoms and signs).

(2) Hormone levels were compared between groups, including FSH (follicle-stimulating hormone), LH (gonadotropin), and E2 (estradiol hormone).

(3) Bone density was compared between groups.

(4) Adverse reactions between price comparison groups included nausea, dizziness, low back pain, and rash.

2.4. Statistical analysis

SPSS 21.0 statistical software was selected to process and analyze the data, the count data were expressed by the number of cases (n) and percentage (%), the x^2 test was implemented, the measurement data were expressed by the mean ± standard deviation (SD), and the t-test was implemented, $P < 0.05$ were considered statistically significant.

3. Results

3.1. Comparing the effective rate of the study group and the control group

Table 1 showed that there was a statistically significant difference in the effective rates of medication between the study group and the control group ($P < 0.05$).

Table 1. The comparison of effective rates between groups [n (%)]

Group	Number of cases	Markedly effective	Effective	Ineffective	Total effective rate
Study group	28	21 (75.00)	7 (25.00)	0 (0.00)	28 (100.00)
Control group	28	15 (53.57)	12 (48.86)	1 (3.57)	27 (85.71)
x^2 value	-	-	-	-	4.3077
P value	-	-	-	-	0.0379

3.2. Comparison of hormone levels between the study group and the control group

Before treatment, the levels of FSH, LH, E2, and other hormones were compared between the groups, and there was no statistically significant difference ($P > 0.05$); after treatment, the levels of FSH, LH, E2, and other hormones in the study group were significantly better than those in the control group ($P < 0.05$). See **Table 2** for details.

Table 2. The comparison of hormone levels between groups before and after treatment (mean ± SD)

Group	Number of cases	FSH (IU/L)		LH (IU/L)		E2 (pmol/L)	
		Before	After	Before	After	Before	After
Study group	28	4.37 ± 0.42	4.26 ± 0.54	6.95 ± 0.55	6.91 ± 0.42	599.41 ± 20.58	570.45 ± 20.24
Control group	28	4.38 ± 0.43	3.97 ± 0.47	6.96 ± 0.65	6.57 ± 0.52	599.68 ± 20.63	587.24 ± 20.53
t value	-	0.0880	2.1435	0.9507	2.6915	0.0490	3.0817
P value	-	0.9302	0.0366	0.0621	0.0094	0.9611	0.0032

3.3. Comparison of bone mineral density between the study group and the control group

There was no significant difference in bone mineral density between the groups ($P > 0.05$) before treatment; after treatment, bone density in the study group was higher than that in the control group ($P < 0.05$). See **Table 3** for details.

Table 3. The bone density comparison between groups before and after treatment (mean ± SD)

Group	Number of cases	Bone density	
		Before treatment	After treatment
Study group	28	0.48 ± 0.02	0.48 ± 0.01
Control group	28	0.49 ± 0.03	0.47 ± 0.01
t value	-	1.4675	3.7416
P value	-	0.1480	0.0004

3.4. Comparison of adverse reactions between the study group and the control group

Table 4 showed that the incidence of adverse reactions in the study group was significantly lower than that in the control group ($P < 0.05$).

Table 4. The comparison of adverse reactions between groups [n (%)]

Group	Number of cases	Nausea	Dizziness	Low back pain	Rash	Total incidence
Study group	28	1 (3.57)	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.57)
Control group	28	2 (7.14)	3 (10.71)	1 (3.57)	1 (3.57)	7 (25.00)
x^2 value	-	-	-	-	-	5.2500
P value	-	-	-	-	-	0.0219

4. Discussion

Endometriosis is a very common gynecological disease that occurs mainly in women of childbearing age. In recent years, the prevalence of this disease has been gradually increasing [5,6]. The endometrium is originally a part of the uterine cavity, and there is a certain period of shedding, which is also known as menstruation. Under the influence of some factors, the endometrium will grow outside the uterine cavity, thereby causing endometriosis [7,8]. At present, the pathogenesis of endometriosis has not yet been clarified. At this stage, it is believed that hormone levels and autoimmune diseases are the causes of its occurrence. Dysmenorrhea is the main presenting symptom and is categorized under secondary dysmenorrhea. As the disease progresses, dysmenorrhea will aggravate, which will then lead to menstrual disorders, infertility, abdominal pain, and other symptoms [9,10]. Endometriosis can be treated with drugs and surgery. Mifepristone is a progesterone receptor antagonist, which is widely used in the fields of terminating pregnancy and resisting implantation of fertilized eggs [11]. This drug is a prescription drug that needs to be used under the guidance of a doctor and can be used in the treatment of endometriosis [12]. Mifepristone can inhibit the growth of ectopic endometrium, resist the growth and reproduction of endometrium in abnormal positions, and induce the degeneration of ectopic endometrium [13]. In the treatment, there is some ambiguity in the effect of different doses of mifepristone. After research, it is found that the effect of low-dose mifepristone in the treatment of endometriosis is more ideal [14].

The experimental results are as follows: after comparing the effective rates of medication between the study group and the control group, there was a statistically significant difference ($P < 0.05$). The effects of different doses of mifepristone in the treatment of endometriosis have certain clinical value. There is a difference between the efficacy of low-dose medication and the effect of conventional-dose medication. Low-dose medication can be used in treatment to reduce the concentration of medication. Before treatment, the levels of FSH, LH, E2, and other hormones were compared between the groups, and there was no statistically significant difference ($P > 0.05$); after treatment, the levels of FSH, LH, E2, and other hormones in the study group were significantly better than those in the control group ($P < 0.05$). Mifepristone has a certain control effect on the periodic ovulation of the ovary and can regulate the nerve center, hinder the development of follicles, and induce ectopic endometrial degeneration. Low-dose medication has little effect on the endocrine level, and the fluctuation of the patient's hormone level is not very large, while the conventional dose of treatment, with a large amount of medication, can cause changes in the hormone level. Before treatment, there was no significant difference in bone mineral density between the groups ($P > 0.05$); after treatment, bone density in the study group was higher than that in the control group ($P < 0.05$). After research, it was found that mifepristone can affect bone density, especially in patients who take a large amount of drugs, the change in bone density will be very significant. Taking low doses of mifepristone, its impact on bone density can be minimized, and will not even have an effect. The incidence of adverse reactions in the study group was significantly lower than that in the control group ($P < 0.05$). Hence, small doses can reduce drug metabolism in the body, reduce adverse drug reactions, and further improve the safety of treatment [15].

In summary, the effect of low-dose mifepristone in the treatment of endometriosis has been affirmed, and its therapeutic effect is no different from that of conventional doses. The hormone level and bone density are relatively stable, and there are few adverse reactions. This treatment regimen is recommended for broad application.

Disclosure statement

The author declares no conflict of interest.

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Analyzing the Application Value and Detection Rate of Combined Abdominal and Vaginal B-Scan Ultrasound in Diagnosing Acute Abdomen in Obstetrics and Gynecology

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Abstract: *Objective:* To analyze the diagnostic value of combined abdominal and vaginal B-scan ultrasound in obstetrics and gynecology acute abdomen. *Methods:* A total of 80 patients with suspected obstetric and gynecological acute abdomen admitted from February 2021 to October 2023 were recruited. All patients underwent abdominal and vaginal B-scan ultrasound examinations, and the pathological results were compared to explore the joint diagnostic value. *Results:* Obstetric and gynecological acute abdomen was confirmed in 68 cases through pathology, 53 cases through abdominal B-scan ultrasound, 60 cases through vaginal B-scan ultrasound, and 67 cases through combined abdominal and vaginal B-scan ultrasound. The combined abdominal and vaginal B-scan ultrasound had significantly higher diagnostic efficiency than that of abdominal B-scan ultrasound alone and vaginal B-scan ultrasound alone ($P < 0.05$). The accuracy of combined abdominal and vaginal B-scan ultrasound in diagnosing obstetric and gynecological acute abdomen is higher than that of abdominal B-scan ultrasound alone and vaginal B-scan ultrasound alone ($P < 0.05$). *Conclusion:* The diagnosis of acute abdomen in obstetrics and gynecology by combined abdominal and vaginal B-scan ultrasound may improve the diagnostic efficiency, enhance the accuracy of acute abdomen classification in obstetrics and gynecology, and have high consistency with pathological results.

Keywords: Acute abdomen in obstetrics and gynecology; Abdominal B-scan ultrasound; Vaginal B-scan ultrasound; Diagnostic value

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1. Introduction

The clinical risk of acute abdomen in obstetrics and gynecology (O&G) is high. The typical pathological feature is severe abdominal pain, often acute attacks, and most patients are in critical condition. If not diagnosed and treated as early as possible, it can threaten the patient's life and health and increase the mortality rate of acute abdomen [1]. Acute abdomen in O&G is related to many triggers, such as ovarian cyst rupture, ovarian cyst pedicle torsion, and ectopic pregnancy. It is easily confused with inflammatory lesions of abdominal organs,

making diagnosis and treatment difficult [2]. Currently, ultrasound technology is mainly used in clinics to diagnose acute abdomen in O&G. It can dynamically and continuously monitor the patient's motor function in real-time. Ultrasound has no radiation hazard and is highly safe when used to examine pregnant women [3]. This study reports 80 patients with suspected O&G acute abdomen admitted from February 2021 to October 2023 as a sample to explore the diagnostic value of combined abdominal and vaginal B-scan ultrasound.

2. General information and methods

2.1. General information

A total of 80 patients with suspected O&G acute abdomen admitted from February 2021 to October 2023 were recruited, aged 24–40 years old with an average of 26.89 ± 2.48 years old, abdominal pain duration of 15–30 minutes with an average of 22.81 ± 3.21 minutes. Pathological diagnosis was made in 68 cases, including 24 cases of ectopic pregnancy, 18 cases of acute pelvic inflammatory disease, 5 cases of intrauterine pregnancy loss, 10 cases of ovarian cyst rupture, 11 cases of endometriosis, and the remaining 2 cases of inflammatory lesions of abdominal organs.

2.2. Inclusion and exclusion standards

Inclusion criteria included: (1) confirmed O&G acute abdomen; (2) occurrence of amenorrhea, vaginal bleeding, lower abdominal pain, and other symptoms; (3) informed consent; and (4) all have sexual life and can accept vaginal B-scan ultrasound examination.

Exclusion criteria included: (1) those with no sexual history; (2) those with infectious diseases; and (3) those with organ, cardiovascular, and cerebrovascular diseases.

2.3. Methods

The examination was completed with the VINNO G60 color ultrasonic diagnostic instrument, and the abdominal probe and vaginal probe were adjusted to 3.5–5.0 MHz and 5.0–7.0 MHz, respectively. The patients were instructed to fill their bladder for an abdominal B-scan ultrasound examination. If necessary, physiological saline was prepared to be injected into the bladder. When the bladder fullness met the examination standards, the scan began at the pubic bone area of the lower abdomen to obtain multi-angle and all-round scan images of the abdomen, to evaluate the size of the uterus, shape, and degree of inflammatory lesions, and observe the uterine effusion, adnexal mass, gestational sac, fetal heart rate, fetal bud, pelvic effusion, and evaluate whether the internal organs were diseased. The patients were then instructed to empty their bladder for a vaginal B-scan ultrasound examination. In the lithotomy position of the bladder, the probe was placed on the vaginal vault area, longitudinal, transverse, and semi-circular scans were conducted, and tilt, rotation, and pumping programs were used to obtain images to evaluate the uterine size, uterine shape, the degree of inflammatory lesions, pelvic effusion, and abdominal mass. If abnormalities were found, the probe was adjusted and explored to obtain multi-angle images. After obtaining the ultrasound images, two experienced sonographers read the images together and compared the pathological results to calculate the diagnostic accuracy of the O&G acute abdomen.

2.4. Observation indicators

The observation indicators of this study included:

(1) Diagnostic efficiency: Compare the pathological results, evaluate the detection status of abdominal B-scan ultrasound, vaginal B-scan ultrasound, and combined abdominal and vaginal B-scan ultrasound, and calculate the diagnostic specificity, sensitivity, and accuracy.

(2) Types of acute abdomen in O&G: including ectopic pregnancy, acute pelvic inflammatory disease, intrauterine pregnancy loss, ovarian cyst rupture, and endometriosis.

2.5. Statistical research

The data of patients with acute abdomen in O&G were calculated using SPSS 21.0; count data were recorded as %, and the χ^2 test was performed; count data were recorded as mean ± standard deviation (SD), and the *t*-test was performed. There was a statistical difference if $P < 0.05$.

3. Results

3.1. Diagnosis results

Table 1 shows that the O&G acute abdomen was confirmed in 68 cases through pathology, 53 cases through abdominal B-scan ultrasound, 60 cases through vaginal B-scan ultrasound, and 67 cases through the combined abdominal and vaginal B-scan ultrasound.

Table 1. Comparison of different ultrasonography examinations and pathological results (%)

Group	Pathologically positive	Pathologically negative	Total
Abdominal B-scan ultrasound positive	42	11	53
Abdominal B-scan ultrasound negative	26	1	27
Total	68	12	80
Vaginal B-scan ultrasound positive	54	6	60
Vaginal B-scan ultrasound negative	14	6	20
Total	68	12	80
Combined diagnosis positive	66	1	67
Combined diagnosis negative	2	11	13
Total	68	12	80

3.2. Diagnostic performance

The diagnostic efficiency of the combined abdominal and vaginal B-scan ultrasound was higher than that of abdominal B-scan ultrasound alone and vaginal B-scan ultrasound alone ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of diagnostic performance [% (*n*)]

Group	Sensitivity	Specificity	Accuracy
Abdominal B-scan ultrasound	61.76 (42/68)	8.33 (1/12)	53.75 (43/80)
Vaginal B-scan ultrasound	79.41 (54/68)	50.00 (6/12)	75.00 (60/80)
Combined diagnosis	97.06 (66/68)	91.67 (11/12)	96.25 (77/80)
χ^2 (abdominal and combined)	25.9048	16.6667	38.5333
P (abdominal and combined)	0.0000	0.0000	0.0000
χ^2 (vaginal and combined)	10.2000	5.0420	16.6747
P (vaginal and combined)	0.0014	0.0247	0.0001

3.3. Types of obstetric and gynecological acute abdomen

Table 3 shows the accuracy of the combined abdominal and vaginal B-scan ultrasound in diagnosing the types

of acute abdomen in O&G was higher than that of abdominal B-scan ultrasound alone and vaginal B-scan ultrasound alone ($P < 0.05$).

Table 3. Comparison of diagnosis in types of acute abdomen in O&G [*n* (%)]

Group	Ectopic pregnancy	Acute pelvic inflammatory disease	Intrauterine pregnancy loss	Ovarian cyst rupture	Endometriosis	Detection rate
Abdominal B-scan ultrasound	15(62.50)	14 (77.78)	5 (100.00)	9 (90.00)	10 (90.91)	53 (77.94)
Vaginal B-scan ultrasound	19 (79.17)	16(88.89)	5 (100.00)	9 (90.00)	11 (100.00)	60 (88.24)
Combined diagnosis	23 (95.83)	18(100.00)	5 (100.00)	10 (100.00)	11 (100.00)	67 (98.53)
χ^2 (abdominal and combined)	-	-	-	-	-	13.8833
P (abdominal and combined)	-	-	-	-	-	0.0002
χ^2 (vaginal and combined)	-	-	-	-	-	5.8303
P (vaginal and combined)	-	-	-	-	-	0.0158

3.4. Ultrasound signs of obstetric and gynecological acute abdomen

The ultrasound signs for each type of acute abdomen in O&G are as follows:

(1) Ectopic pregnancy: Ultrasound images showed no gestational sac in the uterine cavity, but the thickness of the endometrium increased, and some echoes were thickened and enhanced. Mixed masses were observed in the ovary and adnexal areas. Observations of the yolk sac, gestational sac, fetal heartbeat, and fetal bud were found in some patients; there was free fluid observed in the pelvic and abdominal cavities.

(2) Acute pelvic inflammatory disease: Ultrasound scans inside the pelvic cavity showed no echo, and the lesions were primarily located in the uterine and rectal lacunae. Observation of the ovaries showed signs of enlargement. Observation of the appendix area revealed the presence of extended, nodal-shaped, echo-free areas.

(3) Intrauterine miscarriage: Most patients were observed with an increase in uterine volume under ultrasound, and the increase in volume is consistent with the time of menopause. Observation of the inside of the mass showed the presence of regular gestational sacs, and fetal heartbeat and fetal buds were also seen; in a small number of patients, the uterine volume had increased, but there was no embryo inside the mass, and the shape of the gestational sac was irregular. The size did not match the time of menopause.

(4) Ovarian cyst rupture: Ultrasound showed no abnormality in the size of the uterus, no gestational sac in the uterine cavity, and observation of the adnexal area revealed the presence of a cystic-solid mass with no clear boundary. Observation of the posterior pelvic fornix area and pelvic area showed the presence of a free anechoic zone.

(5) Endometriosis: Ultrasound examination of the appendage area showed cystic and anechoic characteristics. Observation of the cyst wall showed rough thickening. Observation of the interior of the cyst cavity revealed the presence of small punctate echoes, and the uterus was uniformly enlarged. The cavity line was deviated anteriorly.

4. Discussion

Acute abdomen in O&G has a rapid onset, and the typical symptom is severe abdominal pain. Patients' lives and health can be endangered if the acute abdomen is not diagnosed and treated in time. Ectopic pregnancy,

acute pelvic inflammatory disease, intrauterine miscarriage, ovarian cyst rupture, and endometriosis are common acute abdomen in O&G with many causes. Therefore, in addition to common abdominal pain, patients have diverse clinical symptoms and manifestations, which directly affect disease diagnosis and treatment [4,5]. In addition, the acute abdomen in O&G progresses rapidly, and doctors need to assess the patient's condition and provide treatment promptly, otherwise, the life and health of O&G patients may be endangered [6]. Surgical pathology is the gold standard for qualitative evaluation of acute abdomen in O&G. However, the speed of pathological diagnosis is slow, which may delay the best time for treatment. Therefore, exploring accurate and high-speed diagnostic solutions is crucial to ensuring the life and health of patients with acute abdomen in O&G and has significant value [7].

At present, ultrasound technology has been widely used in treating patients with acute abdomen in O&G, including abdominal B-scan ultrasound, vaginal B-scan ultrasound, and other forms. The two technologies have different diagnostic efficiencies. Abdominal B-scan ultrasound has a wide range of scans and can obtain information such as organ shape, volume, and location. It can also assist doctors in assessing fluid accumulation in adjacent areas of organs and can initially assess the relationship between gynecological diseases and adjacent organs. However, due to the low frequency of the abdominal B-scan ultrasound probe, it cannot display tiny lesions of gynecological diseases, and it is difficult to detect atypical lesions in sonograms. There is a chance of missed diagnosis and misdiagnosis when diagnosing acute abdomen in O&G [8]. Moreover, those who cannot hold urine for a long time or those with abdominal obesity should not undergo abdominal B-scan ultrasound examination. Otherwise, the quality of B-scan ultrasound imaging will be reduced due to bladder fullness and abdominal fat, making it more challenging to diagnose the disease qualitatively. Before vaginal B-scan ultrasound examination, patients with acute abdomen in O&G do not need to fill their bladders, as this high-frequency probe examination has a higher diagnostic resolution, can directly contact adjacent organs, obtain clear imaging images, and can also detect abnormalities missed by abdominal B-scan ultrasound including micromass [9]. Furthermore, vaginal B-scan ultrasound can also evaluate the patient's pelvic adhesions, which is helpful for doctors to analyze obstetric and gynecological diseases qualitatively. However, vaginal B-scan ultrasound has a small field of view and cannot comprehensively scan adjacent organs. Therefore, vaginal B-scan ultrasound alone also carries a risk of missed diagnosis and misdiagnosis.

Based on the data analysis in this study, 68 cases of obstetric and gynecological acute abdomen were diagnosed by pathology, 53 cases of obstetric and gynecological acute abdomen were confirmed by abdominal B-scan ultrasound, 60 cases of obstetric and gynecological acute abdomen were confirmed by vaginal B-scan ultrasound, and 67 cases of obstetric and gynecological acute abdomen were confirmed by combined diagnosis; The diagnostic efficiency of the combined abdominal and vaginal B-scan ultrasound was higher than that of abdominal B-scan ultrasound alone and vaginal B-scan ultrasound alone ($P < 0.05$). It is suggested that the abdominal B-scan ultrasound can clarify the location of emergency abdominal lesions and evaluate the nature of emergency abdominal lesions. However, poor bladder filling, thick abdominal wall fat, and intestinal gas reflection may affect ultrasound imaging and reduce diagnostic efficiency. Other the other hand, vaginal B-scan ultrasound is a high-frequency probe that can obtain high-definition images, and the probe goes deep into the vagina and directly contacts the pelvic organs. The imaging is not affected by fat and obesity and can detect tiny masses without filling the bladder before the examination. Hence, vaginal B-scan ultrasound shortens the diagnosis time leading to prompt treatment of acute abdomen in O&G, and is helpful to improve diagnostic accuracy, but the scope of examination is small. Therefore, combining abdominal and vaginal B-scan ultrasound is necessary to improve diagnostic efficiency and reduce missed diagnoses and misdiagnosis of acute abdomen in O&G [10-12].

Another set of data showed that the accuracy of the combined abdominal and vaginal B-scan ultrasound in diagnosing the type of acute abdomen in O&G was higher than that of abdominal B-scan ultrasound alone and vaginal B-scan ultrasound alone ($P < 0.05$). This indicated that combined diagnosis can assist doctors in classifying acute abdomen in O&G, and the diagnostic accuracy is high. The abdominal B-scan ultrasound can expand the scanning field of view and assist doctors in clarifying the relationship between the gynecological acute abdomen and adjacent organs. It has a high diagnostic value, especially in examining anterior abdominal wall lesions, despite the low resolution of the abdominal B-scan ultrasound probe leading to cases of misdiagnosis. Vaginal B-scan ultrasound uses a high-frequency probe to complete the examination, which can obtain clear sonograms, and the probe is close to the vaginal vault and cervical area, which can shorten the distance between the probe and the lesion tissue, which is helpful for doctors to diagnose obstetric and gynecological acute abdomen qualitatively [13]. Combining abdominal and vaginal B-scan ultrasound can obtain clearer images, play a complementary role, and are not affected by age, body position, and scanning range. It is helpful for doctors to observe the structure of subtle lesions, thereby increasing diagnostic accuracy [12].

In summary, patients with acute abdomen in O&G received combined abdominal and vaginal B-scan ultrasound for diagnosis, and the results were consistent with pathology and can be promoted in clinical practice.

Disclosure statement

The author declares no conflict of interest.

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The Clinical Anesthesia Effect of Remifentanil Combined with Propofol in Laparoscopic Cholecystectomy in the Elderly

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Abstract: *Objective:* To explore and analyze the effect of remifentanil combined with propofol for anesthesia in patients undergoing laparoscopic cholecystectomy, and to explore its clinical application value. *Methods:* A total of 64 patients who underwent laparoscopic cholecystectomy were selected and randomly divided into two groups, with 32 patients in each group. The anesthesia used in the control group was propofol combined with fentanyl, whereas the observation group was propofol combined with remifentanil and fentanyl. Medical staff routinely performed thyroidectomy on the patients after receiving anesthesia. After the treatment was completed, the researchers recorded the adverse reactions of the patients and the anesthesia effect during laparoscopic cholecystectomy and analyzed the anesthesia effect of the patients. *Results:* After the operation, the excellent and good rates of anesthesia in the observation group were significantly higher ($P < 0.05$). Pain in the observation group was significantly lower ($P < 0.05$). The clinical indicators after receiving anesthesia were significantly better in the observation group ($P < 0.05$). During the operation period, the two groups had different degrees of adverse reactions, while the incidence of adverse reactions in the observation group was relatively lower ($P < 0.05$). *Conclusion:* Patients in the observation group showed better anesthesia and lower pain levels during surgery, higher excellent and good rates of anesthesia, lower VAS scores, and better anesthesia indicators. Therefore, remifentanil-propofol combined anesthesia can be used as an effective anesthesia option in laparoscopic cholecystectomy, which improves the anesthesia effect during the operation and the postoperative pain control of patients and has clinical application value.

Keywords: Diagnosis and treatment methods; Thyroidectomy; Remifentanil; Propofol; Complications

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1. Introduction

With the continuous development and progress of medical technology, laparoscopic cholecystectomy has become a common surgical method in clinical practice [1]. During this surgical procedure, the choice of anesthesia plays a crucial role in the success of the procedure and the patient's postoperative recovery. Laparoscopic cholecystectomy, also known as laparoscopic cholecystectomy, is a common surgical procedure used to treat gallbladder disease, especially cholecystitis or caused by gallstones. The operation uses the laparoscopic technique, and the laparoscope and other surgical instruments are inserted into the patient's

abdominal cavity through several small incisions in the abdominal wall [2]. A laparoscope is a long, thin, tube-shaped instrument with a camera that transmits images of the inside of the abdominal cavity to a monitor for the doctor to view. During the operation, the doctor uses instruments under the guidance of the laparoscope to first expose the gallbladder, and then resect or remove the gallbladder [3]. Typically, the cystic duct between the gallbladder and the liver is clipped or ligated, and the gallbladder is separated from the liver and eventually removed from the abdominal cavity [4]. Laparoscopic cholecystectomy has the advantages of minimal invasiveness and fast recovery but requires highly effective anesthesia. As an efficient anesthetic drug, remifentanil has the characteristics of small side effects, quick onset, and long-lasting effects, and has gradually attracted attention in clinical application [5]. As a commonly used intravenous anesthetic, propofol has no significant inhibitory effect on the respiratory function of patients and has a good sedative effect [6]. Therefore, the combined application of remifentanil and propofol may have a positive effect on the effect of anesthesia in elderly laparoscopic cholecystectomy. The drug effects of remifentanil and propofol are relatively reversible, and the anesthesiologist can adjust the dosage and concentration of the drugs at any time according to the needs of the operation to ensure the depth and stability of anesthesia [7]. This paper explores and analyzes the effect of remifentanil combined with propofol for anesthesia in patients undergoing laparoscopic cholecystectomy, and discusses its clinical application value.

2. Materials and methods

2.1. General information

During the setting of this study, the experimental period from January 2021 to October 2022 was selected, and 64 patients who underwent laparoscopic cholecystectomy during this period were selected for the study. The patients were randomly divided into two groups, each with 32 patients. The control group included 14 male patients and 18 female patients, and the age range was between 19 and 36 years old, with a mean age of 31.2 ± 4.8 years old. The observation group included a total of 16 male and 16 female patients, with an age range between 19 and 35 years old, and the mean age of the patients was 32.9 ± 5.1 years old.

Inclusion criteria included patients aged 18 years and above who underwent laparoscopic cholecystectomy, patients diagnosed with thyroid cancer by clinical and imaging examination; patients whose operation type was laparoscopic cholecystectomy, and patients who can cooperate with and accept remifentanil-propofol combined anesthesia combined with operating room nursing intervention.

Exclusion criteria included patients under the age of 18, patients with severe cardiopulmonary, liver, and kidney dysfunction or other serious underlying diseases, patients with previous allergies to remifentanil, propofol, or other related drugs, patients with active malignant tumors, patients with mental illness or cognitive impairment, unable to cooperate with anesthesia and post-operative care requirements and patients who plan to undergo emergency surgery or have surgical contraindications.

The relevant data in the basic information of the patients in this study were statistically checked to confirm that the test results of the patients were $P > 0.05$, indicating that the comparability was good.

2.2. Methods

In this study, all patients were fasted according to the requirements before undergoing laparoscopic cholecystectomy to ensure that the patients kept an empty stomach during the examination. After entering the operating room, the medical staff established intravenous access for the patients and give the patient 500 mL sodium lactate ringer intravenous injection and the medical staff connected the electrocardiogram indicators to detect the patient's heart rate, blood pressure, and other indicators.

Patients in the control group received propofol combined with fentanyl anesthesia, the specific method was as follows: first, the patients received intravenous injection of 0.05 mg fentanyl, and then received 1 mg/kg propofol 2 minutes after the injection.

Patients in the observation group received remifentanil combined with propofol anesthesia and received intravenous injections of 0.05 mg fentanyl and 0.1 mg/kg remifentanil, and 1.2–1.5 mg/kg propofol 2 min after the injection.

2.3. Evaluation criteria

The evaluation criteria of this study are as follows:

(1) Excellent: the operation process is stable, the patient is in a good state of anesthesia, and the heart rate and blood pressure are stable; the patient has no obvious reaction to the surgical stimulation, the muscles are fully relaxed, and the breathing is stable; there are no adverse reactions such as nausea and vomiting during the operation; the patient's postoperative pain level is low, his/her condition is stable, and he/she is able to eat and move normally.

(2) Good: The operation process is basically stable, the patient is in a good state of anesthesia, and the heart rate and blood pressure fluctuate within an acceptable range; the patient has a slight reaction to the surgical stimulus, but can maintain stability by adjusting the anesthetic; there are occasional mild nausea and vomiting during the operation, which can be quickly relieved; the patient's postoperative pain level is within tolerance, his/her condition is basically stable, and he/she can eat and move.

(3) Poor: The operation process is unstable, the patient is in a poor anesthesia state, and the heart rate and blood pressure fluctuate greatly; the patient has a strong reaction to the surgical stimulus, insufficient muscle relaxation, and unstable breathing; frequent adverse reactions such as nausea and vomiting during the operation, that urgent measures are required; the patient's postoperative pain level is high, his/her condition is unstable, and he/she is not able to eat and move normally.

(4) Anesthesia index: In this study, medical staff evaluated the hemodynamic index of the patient and analyzed the anesthesia effect on the patient.

2.4. Statistical methods

SPSS 22.0 for Windows software is utilized for processing all data in this study. For count and continuous data, significant statistical analysis was adopted, and the significance standard was set at 0.05. When the P value is lower than 0.05, the statistical result is considered to be significant.

3. Results

3.1. Comparison of excellent and good rates of anesthesia between the two groups

After the operation was completed, compared with the control group, the excellent and good rate of anesthesia in the observation group was significantly higher ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of good and good rates of anesthesia between the two groups

Group	Number of cases	Excellent	Good	Poor	Total excellent rate
Observation group	32	15	16	1	96.88%
Control group	32	12	13	7	78.13%
χ^2					9.6547
P					0.0000

3.2. Comparison of pain status before and after surgery in the two groups

Table 2 showed that the pain in the observation group was significantly lower than that in the control group ($P < 0.05$).

Table 2. Comparison of pain status before and after surgery in the two groups

Group	Number of cases	During surgery	After surgery
Observation group	32	5.14 ± 0.63	2.32 ± 0.54
Control group	32	7.25 ± 0.45	5.36 ± 0.66
t		9.6274	8.6241
P		0.0000	0.0000

3.3. Comparison of the anesthesia status of the patients in the two groups

Table 3 showed that after the patients in the observation group received anesthesia, the clinical indicators were significantly better ($P < 0.05$).

Table 3. Comparison of the anesthesia status of the patients in the two groups

Group	Number of cases	Average blood pressure (mmHg)	Heart rate	Blood oxygen saturation
Observation group	32	93.65 ± 2.06	84.45 ± 1.26	97.26 ± 2.81
Control group	32	86.48 ± 1.96	74.85 ± 2.26	92.85 ± 2.96
t		8.2369	9.2624	9.9178
P		0.0000	0.0000	0.0000

3.4. Comparison of adverse reactions between the two groups

During the operation period, the two groups of patients had different degrees of adverse reactions, while the incidence of adverse reactions in the observation group was relatively lower ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of adverse reactions between the two groups of patients (%)

Group	Miscutting of parathyroid glands	Subcutaneous fluid	Wound infection	Total incidence
Observation group ($n = 32$)	1	2	0	9.38%
Control group ($n = 32$)	4	2	3	28.13%
χ^2	-	-	-	9.1954
P	-	-	-	0.0000

4. Discussion

Gallbladder disease refers to various diseases that occur in the gallbladder itself or its surrounding tissues. Among them, the most common disease is gallstones [8]. Gallstones are solid crystals or stones that form in the gallbladder and can lead to serious complications such as cholecystitis and biliary obstruction. For cholecystitis or pain caused by gallstones, laparoscopic cholecystectomy has become the main treatment [9]. The use of laparoscopic cholecystectomy is more complicated in older patients because these patients often have more comorbidities and physiological changes. Therefore, choosing an appropriate anesthesia method is crucial to the success of surgery and postoperative recovery in elderly patients [10]. In this study, the researchers chose

remifentanil combined with propofol as the anesthesia regimen and compared it with propofol combined with fentanyl. Remifentanil is a potent synthetic opioid analgesic with rapid onset and potent analgesic effects and is widely used in anesthesia and postoperative analgesia. Propofol is an intravenous anesthetic with good onset and recovery properties and is commonly used in laparoscopic surgery [11]. The results of the study showed that patients in the observation group who were anesthetized with remifentanil combined with propofol showed better anesthesia and lower pain levels during surgery. The excellent and good rate of anesthesia in the observation group was significantly higher, and the VAS score was lower. At the same time, the incidence of adverse reactions in the observation group was also lower, indicating that the anesthesia regime is relatively safer.

Remifentanil is a powerful narcotic analgesic drug [12], which has the characteristics of rapid onset and significant analgesic effect. Propofol is an intravenous anesthetic drug with the ability to induce and maintain a state of anesthesia. The combined application of these two drugs can give full play to their respective advantages and ensure the depth and stability of anesthesia. The value of compound anesthesia is that it provides better anesthesia effect and postoperative pain control [13]. The strong analgesic effect of remifentanil can effectively reduce pain during surgery and provide better operating conditions. The rapid awakening properties of propofol enable patients to quickly regain consciousness after surgery and reduce the length of hospital stay [14]. In addition, the controllability of compound anesthesia enables anesthesiologists to make individual adjustments according to the specific conditions of patients and surgical needs, improving the safety of surgical procedures [15]. During the anesthesia process, the anesthesiologist can adjust the dosage of remifentanil and propofol according to the patient's specific conditions and surgical needs, so as to achieve the required depth and stability of anesthesia. With its use at appropriate doses, combined remifentanil-propofol anesthesia has a lower risk of respiratory and cardiovascular depression. Anesthesiologists can monitor and adjust according to the specific conditions of patients to ensure the safety of anesthesia.

In summary, the clinical application of remifentanil combined with propofol anesthesia has good effect and value in laparoscopic cholecystectomy. Compared with propofol plus fentanyl anesthesia, patients in the remifentanil plus propofol group showed better anesthesia and lower pain levels during surgery. The excellent and good rate of anesthesia in the observation group was significantly higher, the VAS score was lower, and the anesthesia indexes were better than those in the control group. Therefore, remifentanil-propofol combined anesthesia can be used as an effective anesthesia option in laparoscopic cholecystectomy, which can improve the anesthesia effect during the operation and the postoperative pain control of patients, and has clinical application value.

Disclosure statement

The author declares no conflicts of interest.

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Clinical Research on Aromatherapy Combined with Acupoint Massage on Promoting Natural Childbirth of Primipara

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Abstract: *Objective:* To discuss and analyze the clinical research of aromatherapy combined with acupoint massage on promoting natural childbirth of primipara. *Methods:* A total of 100 primiparas who gave birth in the obstetrics department of our hospital from May 2022 to May 2023 were recruited and divided into the experiment group (n = 50) and the reference group (n = 50). The experiment group received a nursing that includes aromatherapy and acupoint massage, and the reference group received routine midwifery nursing. Bad mood, pain degree, sleep quality, labor time, and satisfaction were compared between the two groups. *Results:* Before nursing, there was no statistically significant difference in all the observation indicators between the two groups ($P > 0.05$). After nursing, the anxiety, depression, and other negative emotions, pain degrees, sleep quality, and satisfaction degree of the experiment group were significantly better than those in the reference group ($P < 0.05$). The duration of labor in the experiment group was shorter than that of the reference group ($P<0.05$). *Conclusion:* Aromatherapy combined with acupoint massage can promote the natural delivery of primipara, and it is worthy of wide application and promotion.

Keywords: Aromatherapy; Acupoint massage; Primipara natural childbirth

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1. Introduction

Childbirth is a physiological process. Primipara refers to women who have given birth for the first time. The progress of labor in primipara is relatively slow. Primiparas are prone to some adverse psychological states when facing childbirth, which in turn affect the labor process and delivery method [1]. At present, it is considered that cesarean section is the best way of delivery. In recent years, the rate of cesarean section has been increasing frequently. After a cesarean section, there is a certain chance of having postoperative complications such as postpartum hemorrhage, infection, etc. The postoperative recovery period is long, which will cause certain damage to the health of the parturient [2]. A corresponding system has been formulated for cesarean section, and cesarean section is not performed unless necessary. In order to alleviate the pain and psychological barrier of the parturient, certain improvements have been made in nursing [3,4]. The application of routine nursing in primipara mainly focuses on observing the labor process and providing treatment measures and has little

effect on the promotion of natural childbirth and the intervention of maternal psychology [5,6]. Based on this, aromatherapy and acupoint massage are carried out to increase the intervention of primipara in natural childbirth. Aromatherapy is a therapy that diffuses and emits the aroma of essential oils through smoked lamps to soothe the mind of pregnant mothers, while acupoint massage stimulates the mothers' nerve center, relieves pain, and promotes natural childbirth [7,8]. This article aims to study and analyze the effect of aromatherapy combined with acupoint massage on promoting the natural childbirth of primipara.

2. Materials and methods

2.1. General information

From May 2022 to May 2023, 100 primiparas who gave birth in the obstetrics department of the Nanjing Maternity and Child Health Hospital were recruited, and all primiparas were given lumbar puncture analgesia by experienced and trained anesthesiologists; at the same time, the ECG monitor closely monitors the primipara's blood pressure, oxygen saturation, and pulse rate for 2 hours. After the vital signs were stable, the experimental control study was started; the random number drawing method was used to divide the patients into the experiment group (n = 50) and the reference group (n = 50). The experiment group had an age range of 23–37 years old with an average age of 30.24 ± 1.55 years old, a pregnancy cycle of 39–42 weeks with an average pregnancy cycle of 40.35 ± 0.66 weeks, a body weight range of 19–22 kg/m^2 with an average body weight of 20.51 ± 1.22 kg/m^2. The reference group had an age range of 22–37 years old with an average age of 30.31 ± 1.49 years old, a pregnancy cycle of 40–42 weeks with an average pregnancy cycle of 40.43 ± 0.69 weeks, a body weight range of 19–21 kg/m^2 with an average body weight of 20.31 ± 1.18 kg/m^2. There was no statistically significant difference ($P > 0.05$) in general information such as age, pregnancy cycle, and body weight between the groups.

Inclusion criteria included primiparas, pregnant with one baby, full-term primiparas, and primiparas with informed consent.

Exclusion criteria included primiparas with pregnancy complications, primiparas with organ failure, and primiparas with coagulation dysfunction.

2.2. Methods

The reference group was given routine nursing care: observe the progress of the uterine contractions and labor process, and provide corresponding nursing measures.

The experiment group received aromatherapy and acupoint massage:

(1) Aromatherapy: puerpera who received labor analgesia for 2 hours and whose vital signs were stable was led to a specific waiting room with the room temperature at about 25°C, and puerpera may choose a comfortable position to lie on. On the bed, soft pillows and other items can be used to support the waist of the puerpera. Safe essential oils were used and put on the incense lamp and the aroma of essential oils was spread in the room.

(2) Acupoint massage: Sanyinjiao, Zusanli, Kunlun, Hegu, and other acupoints were selected during the incubation period. Quchi, Baihui, Fengchi, Taiyang, Yintang, Jianjing, and other acupoints were added during the active period. Avoid massage during the painful period of uterine contraction. Continue to massage each acupoint for about 3 seconds, then relax for 1 second, and repeat the massage for 5 groups. The intensity should be soft and steady.

2.3. Observation indicators

The observation indicators in this study included:

(1) The adverse emotions were compared between the groups, and evaluated with the Self-Rating Anxiety

Scale (SAS score) and the Self-Rating Depression Scale (SDS score).

(2) The degree of pain and sleep quality were compared between the groups, evaluated by Visual Analog Scale (VAS score) with 0–10 points and by Pittsburgh Sleep Quality Index (PSQI score) with 20–80 points, respectively.

(3) The time of labor between the groups was compared, including the time of the first stage of labor, the second stage of labor, and the third stage of labor.

(4) Satisfaction between groups was compared and evaluated with a self-made satisfaction scale and categorized into very satisfied, average, and dissatisfied.

2.4. Statistical analysis

SPSS 21.0 statistical software was selected to process and analyze the data, the count data were expressed by the number of cases (n) and percentage (%), the χ^2 test was implemented; the measurement data were expressed by the mean ± standard deviation (SD), and the t-test was implemented. $P < 0.05$ was considered statistically significant.

3. Results

3.1. Comparing the negative emotions of the experiment group and the reference group

Before the nursing, the negative emotions such as anxiety and depression in the two groups were compared, and there was no statistically significant difference ($P > 0.05$); after the nursing, the anxiety, depression, and other negative emotions in the experiment group were significantly better than those in the reference group ($P < 0.05$). See **Table 1** for details.

Table 1. Comparison of bad emotions between groups (mean ± SD, points)

Group	Number of cases	Anxiety		Depression	
		Before the nursing	After the nursing	Before the nursing	After the nursing
Experiment group	50	52.21 ± 5.61	34.28 ± 4.27	53.77 ± 5.49	33.24 ± 4.51
Reference group	50	52.31 ± 5.45	41.27 ± 4.61	53.81 ± 5.68	40.58 ± 4.29
t value	-	0.0904	7.8658	0.0358	8.3380
P value	-	0.9281	0.0000	0.9715	0.0000

3.2. Comparing the pain degree and sleep quality between the experiment group and the reference group

Before the nursing, the pain degree and sleep quality of the two groups were compared, and there was no statistically significant difference ($P > 0.05$); after the nursing, the pain degree and sleep quality of the experiment group were significantly better than those of the reference group ($P < 0.05$). See **Table 2** for details.

Table 2. Comparison of pain degree and sleep quality between groups (mean ± SD, points)

Group	Number of cases	Pain degree		Sleep quality	
		Before nursing	After nursing	Before nursing	After nursing
Experiment group	50	8.68 ± 1.14	5.24 ± 1.68	7.55 ± 1.65	5.21 ± 1.57
Reference group	50	8.66 ± 1.51	6.84 ± 1.75	7.49 ± 1.76	6.88 ± 1.34
t value	-	0.0747	4.6637	0.1758	5.7209
P value	-	0.9406	0.0000	0.8608	0.0000

3.3. Comparing the labor time between the experiment group and the reference group

Table 3 showed that the time spent in the first stage of labor, the second stage of labor, and the third stage of labor in the experiment group were significantly lower than that in the reference group ($P < 0.05$.

Table 3. Comparison of labor time between groups (mean ± SD)

Group	Number of cases	The first stage of labor (h)	The second stage of labor (min)	The third stage of labor (min)
Experiment group	50	8.57 ± 2.57	49.22 ± 10.68	7.55 ± 2.51
Reference group	50	10.66 ± 2.43	70.58 ± 12.69	9.75 ± 2.61
t value	-	4.1783	9.1063	4.2960
P value	-	0.0001	0.0000	0.0000

3.4. Comparing the satisfaction of the experiment group and the reference group

Table 4 showed that the satisfaction degree of the experiment group was significantly higher than that of the reference group ($P < 0.05$).

Table 4. Satisfaction comparison between groups (mean ± SD)

Group	Number of cases	Very satisfied	Generally satisfied	Dissatisfied	Total satisfaction rate
Experiment group	50	41 (82.00)	9 (18.00)	0 (0.00)	50 (100.00)
Reference group	50	28 (56.00)	17 (34.00)	5 (10.00)	45 (90.00)
χ^2 value	-	-	-	-	5.2632
P value	-	-	-	-	0.0217

4. Discussion

Primiparas experience childbirth for the first time, are not familiar with the process of childbirth, and do not have enough experience in childbirth. They will have psychological emotions such as tension and anxiety when facing the pain of uterine contractions and childbirth [9,10]. Negative emotions will have a serious impact on the delivery of the parturient, such as aggravated pain, prolonged labor, inability to give birth naturally, etc. [11]. The midwifery work of primipara is the current focus of clinical attention [12]. Epidural anesthesia is a commonly used method of labor analgesia by obstetricians. This method of labor analgesia is easily accepted by puerpera and their families and is widely used in clinical practice, but there are still some shortcomings. Epidural anesthesia for labor analgesia can induce fetal distress, cause severe asphyxia in the newborn, inhibit uterine contraction, and cause uterine contraction fatigue, which is not conducive to the development of the labor process and increases the incidence of cesarean section and assisted vaginal delivery. Hence, intervention measures for the natural childbirth of primiparas from the perspective of nursing were taken to relieve maternal emotions, reduce maternal pain, and accelerate the progress of labor [13]. During the delivery process, the puerpera needs to experience uterine contraction pain for a long time and may experience adverse phenomena such as hyperventilation and physical exhaustion. Under the influence of various factors, cesarean section will eventually be used for delivery [14]. Traditional Chinese medicine defines labor pain as poor circulation of blood and qi, and some means and measures need to be taken to promote the circulation of blood and qi to relieve pain. Aromatherapy is a new type of intervention that green and safe essential oils were chosen, smoked lamps were used to diffuse the aroma of essential oils, the temperature in the room was adjusted, and the aromas were fully dissipated. It can promote blood flow in the body, relieve muscle tension, and stretch bad emotions [15].

Acupoint massage promotes blood circulation by stimulating acupuncture points, relieves maternal pain, and also improves mood to a certain extent.

Before the implementation, the anxiety, depression, and other negative emotions of the two groups were compared, and there was no statistically significant difference ($P > 0.05$), after the nursing, the anxiety, depression, and other negative emotions of the experiment group were significantly better than those of the reference group ($P < 0.05$). Before the nursing, the pain degree and sleep quality of the two groups were compared, and there was no statistically significant difference ($P > 0.05$), after the nursing, the pain degree and sleep quality of the experiment group were significantly better than those of the reference group ($P < 0.05$). The time spent in the first stage of labor, the second stage of labor, and the third stage of labor in the experiment group were significantly lower than that in the reference group ($P < 0.05$). The satisfaction degree of the experiment group was significantly higher than that of the reference group ($P < 0.05$).

In summary, aromatherapy has a better effect on improving the mood of patients. It can relax the muscles and ligaments of the uterus, relieve pain, prevent excessive physical exertion of the parturient, and prepare for the third stage of labor. Acupressure stimulates nerve conduction, increases the pain threshold, stimulates the release of serotonin, and relieves pain. The joint application of aromatherapy and acupoint massage can strengthen the improvement effect on maternal mood, reduce the pain caused by uterine contractions, improve sleep quality, shorten the time of each labor process, speed up childbirth, and achieve ideal satisfaction. It is worthy of widespread clinical application and promotion.

Disclosure statement

The author declares no conflicts of interest.

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Effect of Carboprost Tromethamine Combined with Uterine Strap Suture in the Treatment of Patients with Postpartum Hemorrhage Caused by Uterine Atony

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Abstract: *Objective:* To explore and analyze the effect of carboprost tromethamine combined with uterine strap suture in the treatment of postpartum hemorrhage caused by uterine atony. *Methods:* A total of 90 patients with postpartum hemorrhage due to uterine atony who were admitted to the Obstetrics Department of Dazhou Women and Children's Hospital from July 2020 to July 2023 were included in the study. They were grouped by odd and even numbers, and divided into the surgery group (n = 45) and the drug group (n = 45). The surgery group was treated with carboprost tromethamine and uterine strap suture, and the drug group was treated with carboprost tromethamine. The total effective rate, blood coagulation index, fibrinolytic function level, bleeding, and hemoglobin changes were compared between the two groups. *Results:* The total effective rate of the surgery group was significantly higher than that of the medication group ($P < 0.05$). Before treatment, the blood coagulation indicators were insignificant between the groups ($P > 0.05$); after treatment, the blood coagulation indicators in the surgery group were significantly better than those in the drug group ($P < 0.05$). Before treatment, the levels of fibrinolytic functions were insignificant between the groups ($P > 0.05$); after treatment, the levels of fibrinolytic functions in the surgery group were significantly better than those in the drug group ($P < 0.05$). The 2 h and 24 h blood loss and hemoglobin changes in the surgery group were significantly lower than those in the drug group ($P < 0.05$). *Conclusion:* Carboprost tromethamine combined with strap sutures can effectively control postpartum hemorrhage caused by uterine atony.

Keywords: Carboprost tromethamine; Strap sutures; Postpartum hemorrhage; Uterine atony

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1. Introduction

Postpartum hemorrhage is a complication that occurs after childbirth, and it is a key factor leading to maternal mortality, with a high mortality rate [1]. Uterine atony is a common cause of postpartum hemorrhage. With abnormal uterine contraction, the sinusoids on the side of the placenta will be in an open state, which then prevents blood coagulation and causes massive hemorrhage [2]. The symptoms of postpartum hemorrhage are

related to the amount of blood loss, and excessive blood loss can cause severe symptoms such as shock and anemia. Carboprost tromethamine is a prostaglandin that has an effect on the contraction of the uterus and is a commonly used drug in the treatment of postpartum hemorrhage [3]. Uterine strap suture is a method of surgical treatment of postpartum hemorrhage, which can avoid hysterectomy and maintain the patient's reproductive system. Combining carboprost tromethamine with uterine strap suture will have a stronger hemostatic effect and improve the efficiency of treatment [4]. This article aims to study and analyze the effect of carboprost trometamol combined with uterine strap suture in the treatment of patients with postpartum hemorrhage caused by uterine atony.

2. General information and methods

2.1. General information

A total of 90 patients with postpartum hemorrhage due to uterine atony who were admitted to the Obstetrics Department of Dazhou Women and Children's Hospital from July 2020 to July 2023 were included in the study. They were divided into the surgery group (n = 45) and the drug group (n = 45). The age in the surgery group was 24–37 years old, with an average age of 30.27 ± 1.85 years; the pregnancy cycle was 37–42 weeks, with an average pregnancy cycle of 39.68 ± 0.75 weeks. The age in the drug group was 23–37 years old, with an average age of 30.46 ± 1.79 years; the pregnancy cycle was 38–42 weeks, with an average pregnancy cycle of 39.85 ± 0.81 weeks. There was no statistically significant difference (P > 0.05) in general information such as age and pregnancy cycle between the groups.

Inclusion criteria included patients who met the diagnosis of uterine atony postpartum hemorrhage, patients with informed consent, and patients with a single pregnancy.

Exclusion criteria included patients who are allergic to the drugs used, patients with incomplete clinical data, patients with pregnancy complications, and patients with uterine injury.

2.2. Methods

The drug group was treated with intramuscular injection of carboprost tromethamine (250 μg), and the number of injections could be increased according to the condition.

Carboprost tromethamine and uterine strap suture were used in the surgery group, where the usage of carboprost tromethamine was the same as the drug group. The uterine strap suture was given as follows: the needle was inserted at the lower right edge of the uterine ostium, then exited at the side, the thread was pulled to the fundus of the uterus and wrapped vertically towards the posterior wall, the needle was then inserted into the uterine cavity and posterior wall, and passed through the anterior wall vertically. The needle was inserted on the left side of the anterior wall of the uterus, passed through the lower edge of the left incision, and exited, followed by pressing the uterus and tying the suture.

2.3. Observation indicators

The observation indicators of this study included:

(1) The total effective rate of treatment between the groups was categorized into markedly effective (within 15 minutes, the uterine contraction was better, and the bleeding was significantly reduced), effective (within 30 minutes, the uterine contraction was restored, and the bleeding was slightly reduced), and ineffective (poor uterine contraction and uncontrolled bleeding).

(2) Coagulation indicators were compared between groups, including thrombin time (TT), plasma prothrombin time (PT), and activated partial thromboplastin time (APTT).

(3) Fibrinogen (Fib) and D-dimer (DD) levels were compared between groups.

(4) The bleeding and hemoglobin (Hb) changes between the groups were compared, and the amount of bleeding at 2 h and 24 h was counted.

2.4. Statistical analysis

SPSS 21.0 statistical software was selected to process and analyze the data. The count data were expressed by the number of cases (*n*) and percentage (%), and the χ^2 test was implemented. The measurement data were expressed by the mean ± standard deviation (SD), and the *t*-test was implemented. $P < 0.05$ was considered statistically significant.

3. Results

3.1. Comparison of the total effective rate of the surgery group and the drug group

Table 1 showed that the total effective rate of the surgery group was significantly higher than that of the medication group ($P < 0.05$).

Table 1. The comparison of the total effective rate of treatment among the groups [n(%)]

Group	Number of cases	Markedly effective	Effective	Ineffective	Total effective rate
Surgery group	45	32 (71.11)	12 (26.67)	1 (2.22)	44 (97.78)
Drug group	45	28 (62.22)	11 (24.44)	6 (13.33)	39 (86.67)
χ^2 value	-	-	-	-	3.8726
P value	-	-	-	-	0.0490

3.2. Comparison of blood coagulation indicators between the surgery group and the drug group

Before treatment, TT, PT, APTT, and other coagulation indicators were compared between the groups, and there was no statistically significant difference (P>0.05); after treatment, TT, PT, APTT, and other coagulation indicators in the surgery group were significantly better than those in the drug group (P< 0.05). See **Table 2** for details.

Table 2. Comparison of blood coagulation indicators among the groups (mean ± SD, s)

Group	Number of cases	TT		PT		APTT	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Surgery group	45	15.21±1.21	13.57±0.25	11.52±1.64	13.57±0.94	28.54±1.75	31.24±0.56
Drug group	45	15.35±1.26	14.85±1.22	11.62±1.75	12.14±1.24	28.49±1.68	30.55±1.25
t-value	-	0.5376	6.8948	0.2797	6.1649	0.1382	3.3793
P value	-	0.5922	0.0000	0.7804	0.0000	0.8903	0.0011

3.3. Comparing the level of fibrinolytic function between the surgery group and the drug group

Before treatment, the levels of fibrinolytic functions such as Fib and D-D were compared between the groups, and there was no significant difference ($P > 0.05$); after treatment, the levels of fibrinolytic functions such as Fib and D-D in the operation group were significantly better than those in the drug group ($P < 0.05$). See **Table 3** for details.

Table 3. The comparison of fibrinolytic function levels among the groups (mean ± SD)

Group	Number of cases	Fib (g/L)		DD (mg/L)	
		Before treatment	After treatment	Before treatment	After treatment
Surgery group	45	3.15±0.52	3.91±0.45	3.75±0.64	2.45±0.55
Drug group	45	3.16±0.56	3.36±0.39	3.78±0.59	3.01±0.48
t-value	-	0.0877	6.1958	0.2311	5.1460
P value	-	0.9303	0.0000	0.8177	0.0000

3.4. Comparison of bleeding and Hb changes between the surgery group and the drug group

Table 4 showed that the 2 h and 24 h blood loss and Hb changes in the operation group were significantly lower than those in the medication group ($P < 0.05$).

Table 4. The comparison of bleeding and Hb changes among the groups (mean ± SD)

Group	Number of cases	2 h bleeding volume (mL)	24 h bleeding volume (mL)	Hb change (g/L)
Surgery group	45	375.24±65.21	842.61±75.21	37.21±4.28
Drug group	45	410.58±70.59	881.52±90.22	32.45±3.69
t-value	-	2.4668	2.2222	5.6504
P value	-	0.0156	0.0288	0.0000

4. Discussion

After a full-term pregnancy pregnant women face childbirth that has certain risks, and postpartum complications will also seriously affect the health and life of parturients [5]. Postpartum hemorrhage is one of the common complications. Assisted reproductive technology, older women, and scarred uterus are all causes of postpartum hemorrhage. Postpartum hemorrhage caused by uterine atony is the most common type of postpartum hemorrhage [6]. It refers to the after-delivery condition when the uterine contraction power is insufficient, blood cannot coagulate, and the vascular cavity is in an open state, resulting in a large amount of blood outflow, decrease in blood volume, excessive blood loss, and death of the patient [7]. Therefore, it is necessary to take drugs that stimulate uterine contraction, close blood vessels, and reduce postpartum hemorrhage. Carboprost tromethamine is widely used in the treatment of postpartum hemorrhage as it works rapidly and effectively to promote uterine contraction [8,9]. The drug inhibits adenylate cyclase, increases the concentration of calcium ions, and promotes muscle fiber contraction. It can also stimulate cell communication and stabilize the contraction state of the uterus [10]. Carboprost tromethamine can control the blood vessels of muscle fibers in multiple directions, close the blood vessel channels, and then play a hemostatic effect [11,12]. Combined treatment of carboprost tromethamine with uterine strap suture can enhance the effect of hemostasis [13,14]. Uterine strap suture is a new type of suture that sutures the front and rear walls of the uterus under pressure to close the blood sinus, and the effect of hemostasis is immediate. However, it cannot adjust uterine contraction on its own, and its control effect on lower uterine segment bleeding is average. Therefore, it can be used in combination with carboprost tromethamine to achieve hemostasis by pressing the uterus and closing the open blood flow channel. The combined treatment can also promote uterine contraction and strengthen the control of lower uterine segment bleeding [15].

The experimental results are as follows: The total effective rate of the surgery group was significantly higher than that of the drug group ($P < 0.05$); The coagulation indicators between the two groups were insignificantly different before treatment, but the indicators were significantly better in the surgery group as compared to the drug group after treatment ($P < 0.05$). Similarly, the levels of fibrinolytic functions were insignificant between the two groups before treatment, but the levels were better in the surgery group as compared to the drug group after treatment ($P < 0.05$). The 2 h and 24 h blood loss as well as Hb changes in the surgery group were significantly lower than those in the drug group ($P < 0.05$). After the treatment with carboprost tromethamine and uterine strap suture, postpartum hemorrhage was significantly controlled, coagulation indicators were restored to a certain extent, and the amount of bleeding was significantly reduced.

In summary, carboprost tromethamine and uterine strap suture have stronger control on postpartum hemorrhage caused by uterine atony, and the treatment effect is remarkable.

Disclosure statement

The authors declare no conflict of interest.

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The Intervention Effect of Full-Responsibility Midwifery in Conjunction with Guided Labor Accompaniment on Maternal Birth Outcome

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Abstract: *Objective:* To investigate and analyze the intervention effect of full responsibility midwifery with guided labor accompaniment on maternal birth outcomes. *Methods:* 68 cases of labor and delivery from January 2021 to December 2022 in Yancheng Dafeng People's Hospital were selected and grouped into the study group (n = 34) and the control group (n = 34). The pregnant women in the control group were in full-responsibility midwifery nursing intervention, and the pregnant women in the study group were in full-responsibility midwifery with guided labor accompaniment. The duration of labor, the rate of spontaneous delivery, the incidence of adverse pregnancy outcomes, and satisfaction with nursing care between the two groups were recorded and evaluated. *Results:* The duration of labor in the study group was lower than that in the control group ($P < 0.05$); the rate of spontaneous delivery in the study group was higher than that in the control group ($P < 0.05$); the incidence of adverse pregnancy outcomes in the study group was lower than that in the control group ($P < 0.05$); and the nursing care satisfaction in the study group was higher than that in the control group ($P < 0.05$). *Conclusion:* Full-responsibility midwifery with guided labor accompaniment can shorten the duration of labor, increase the rate of spontaneous delivery, reduce the incidence of adverse pregnancy outcomes, and achieve higher satisfaction of maternal care, which is of value for popularization and application.

Keywords: Full-responsibility midwifery; Guided labor accompaniment; Labor; Birth outcomes

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1. Introduction

Physiological and psychological changes can occur to varying degrees during labor and delivery. Pain during labor can lead to a significant increase in maternal catecholamine and adrenocorticotropic hormone levels, increasing maternal blood pressure and heart rate, and affecting the emotional state of the pregnant women, which can lead to a variety of adverse pregnancy outcomes [1,2]. In order to ensure the successful completion of labor and delivery, it is necessary to implement effective nursing interventions. Full-responsibility midwifery nursing care assigns experienced and highly skilled nursing staff to be responsible for the implementation of midwifery-related operations and accompany the pregnant women throughout the labor and delivery so that all kinds of abnormalities can be dealt with promptly, which can help to improve the outcome of pregnancy

[3]. Under the mode of guided labor accompaniment, nursing staff provide comprehensive physiological and psychological interventions for pregnant women and guide them to establish confidence in natural childbirth, which can improve the physical and mental state of the pregnant women [4]. In this study, 68 cases of women were selected to analyze the clinical effects of full-responsibility midwifery with guided labor accompaniment.

2. General information and methods

2.1. General information

This study was approved by the Medical Ethics Committee. A total of 68 cases of women who underwent labor and delivery in Yancheng Dafeng People's Hospital were selected for the study period from January 2021 to December 2022 and were into a study group (n = 34) and a control group (n = 34) using odd and even digits of medical record number grouping. The maternal age range interval in the study group was 22–35 years with a median age of 28.59 ± 3.44 years and the gestational week range interval was 37–40 weeks with a median of 38.42 ± 0.65 weeks. In the control group, the maternal age range was 24–34 years with a median of 28.63 ± 3.49 years, and the gestational week range was 38–40 weeks with a median of 38.72 ± 0.54 weeks. The general data of pregnant women in the two groups were comparable ($P > 0.05$).

Inclusion criteria included patients with single fetus full-term pregnancy, normal intrauterine development of the fetus with no contraindication to a vaginal trial of labor and no complications during pregnancy, and patients who signed the informed consent document for the study.

Exclusion criteria included patients with multiple or non-cephalic pregnancies, diagnosed with psychiatric and psychological diseases, and unable to cooperate with the completion of the study.

2.2. Methods

The control group received full-responsibility midwifery nursing intervention, the specific measures are as follows:

(1) Classification of midwifery nursing personnel: Nursing management personnel selected experienced nursing staff with skilled nursing operation techniques to be responsible for midwifery nursing interventions, determined the pregnant women for whom each nursing staff is responsible, required the nursing staff to understand the individual conditions of the pregnant women in detail, and formulated midwifery nursing measures according to the physical and mental state of the pregnant women.

(2) Midwifery nursing intervention:

a. Pre-delivery care: Before delivery, nursing staff took the initiative to communicate with pregnant women and their families, introduced the delivery process and precautions, and emphasized the advantages of natural delivery. Nursing staff carried out psychological interventions for the pregnant women, introduced information to the pregnant women who gave birth naturally, instructed the pregnant women to relax their bodies and minds through deep breathing, and made the pregnant women build up confidence in natural childbirth through positive language guidance.

b. Nursing care during labor: The nursing staff strictly monitored the progress of labor, observed whether there were any abnormalities in the vital signs of pregnant women, instructed pregnant women to breathe correctly and exert, and then instructed pregnant women to replenish water and energy, and rest appropriately after entering the contraction interval. During labor, nursing staff massaged the uterus of pregnant women and promoted contractions through physical touch, verbal encouragement, and other ways to accelerate the progress of labor.

c. Post-delivery care: After the delivery of the fetus, the nursing staff cleaned the nasal cavity and oral

secretions, monitored the contractions and vaginal bleeding, and guided pregnant women to have early contact with their newborn.

The study group underwent full-responsibility midwifery with guided labor accompaniment. The full-responsibility midwifery nursing intervention was the same as the control group. The measures for the guided labor accompaniment are as follows:

(1) Hospitalization: After admission, the nursing staff introduced the hospital environment and the medical staff team, explained the content and role of guided labor accompaniment in a simple manner, and answered any questions raised by pregnant women.

(2) Nursing care in the first stage of labor:

a. Nursing staff monitored the progress of labor, arranged for family members of pregnant women to enter the delivery room during the first stage of labor for accompaniment until the patients completed the delivery, and guided the family members to provide psychological comfort to the pregnant women.

b. When pregnant women entered the latent phase of the first stage of labor, nursing staff assessed the degree of maternal pain and guided them to perform the Lamaze breathing pain relief method to relieve pain. When pregnant women entered the first active stage of labor, the ball nursing intervention was used, the nursing staff instructed the pregnant women to hold the bedrail and have their legs apart while sitting on the top of the ball, slowly rotating the hip joints, allowing the use of gravity and pelvic activity to drive the rotation and descent of fetus in the birth canal, and instructing the pregnant women to rotate while maintaining a standing, squatting, walking and other positions.

Nursing staff accompanied the pregnant women throughout the whole process, informed the progress of labor promptly, gave psychological support to the pregnant women through physical touch and other ways, and cooperated with hot compresses on the waist and back as well as massage to reduce physical and mental discomfort.

(3) Nursing care in the second stage of labor:

a. In the early stage of the second stage of labor, the nursing staff instructed pregnant women to stay in semi-sitting, squatting, and standing positions alternately according to their personal wishes, and adjusted to other positions after 4–6 contractions were produced in each position.

b. After the fetal head was exposed, the nursing staff instructed pregnant women to keep the side-lying position, breathe correctly, and relax, provided the pregnant women with drinking water promptly, wiped the sweat off for pregnant women, and protected the perineum properly.

(4) Post-delivery care: After the delivery, nursing staff congratulated pregnant women and their family members, gave explanations on breastfeeding, newborn care, and other knowledge to pregnant women, and arranged for early contact between pregnant women and their newborns.

2.3. Evaluation criteria

Statistics on the duration of labor, natural delivery rate, the incidence of adverse pregnancy outcomes, and the satisfaction of maternal care in the two groups were recorded using the hospital's self-developed questionnaire.

2.4. Statistical methods

SPSS 23.0 software was used to calculate all kinds of data. The measurement data is mean ± standard deviation (SD), and the *t*-test method was used. The count data is %, and the χ^2 test method was used. $P < 0.05$ if there is a difference between the groups.

3. Results

3.1. Comparison of maternal labor time between the two groups

Table 1 shows that the maternal labor time in the study group was lower than that in the control group ($P < 0.05$).

Table 1. Comparison of maternal labor time between the two groups (mean ± SD, min)

Group	The first stage of labor	The second stage of labor	Total stage of labor
Study group ($n = 34$)	384.75 ± 12.66	42.05 ± 5.72	426.47 ± 25.06
Control group ($n = 34$)	411.73 ± 15.98	51.88 ± 6.94	462.74 ± 28.35
t-value	7.717	6.373	5.589
P-value	0.000	0.000	0.000

3.2. Comparison of the rate of spontaneous delivery of women in the two groups

Table 2 shows that the maternal natural delivery rate of the study group was higher than that of the control group ($P < 0.05$).

Table 2. Comparison of maternal natural delivery rate in the two groups [n (%)]

Group	Natural delivery	Lateral episiotomy	Staged cesarean section	Natural delivery rate
Study group ($n = 34$)	28	5	1	28（82.4）
Control group ($n = 34$)	20	10	4	20（58.8）
χ^2-value				4.533
P-value				0.033

3.3. Comparison of the incidence rate of maternal adverse pregnancy outcomes between the two groups

Table 3 shows that the incidence rate of maternal adverse pregnancy outcomes in the study group was lower than that in the control group ($P < 0.05$).

Table 3. Comparison of the incidence rate of maternal adverse pregnancy outcomes between the two groups [n (%)]

Group	Postpartum hemorrhage	Fetal distress	Neonatal asphyxia	Incidence of adverse pregnancy outcomes
Study group ($n = 34$)	1	1	0	2 (5.9)
Control group ($n = 34$)	3	3	2	8 (23.5)
χ^2-value				4.220
P-value				0.039

3.4. Comparison of maternal care satisfaction between the two groups

Table 4 shows that the maternal care satisfaction of the study group was higher than that of the control group ($P < 0.05$).

Table 4. Comparison of maternal nursing satisfaction between the two groups [n (%)]

Group	Satisfied	More satisfied	Dissatisfied	Nursing care satisfaction
Study group (n = 34)	27	6	1	33 (97.1)
Control group (n = 34)	22	6	6	28 (82.4)
χ^2-value				3.981
P-value				0.046

4. Discussion

Research statistics show that more than 90% of women in labor have serious fear and nervousness during delivery, and the psychological burden is more severe as adverse emotions may lead to a reduction in maternal tolerance of labor pain, an increase in the body's secretion of catecholamines, accelerated heart rate and respiratory rate, and irregular contractions, which can then lead to a variety of adverse pregnancy outcomes [5,6]. In order to ensure the successful completion of natural labor, it is necessary to adopt a comprehensive and systematic nursing intervention to improve the physical and mental state of pregnant women [7].

The full-responsibility system of midwifery is a widely-used nursing service model in obstetrics, in which nursing staff establish a one-on-one nursing service relationship with pregnant women and provide a complete and systematic nursing service, which meets the requirements of pregnant women for the quality of nursing care and ensure the safety of labor and delivery. Mothers' emotions fluctuate greatly during labor and delivery, and adverse emotions can affect the process of labor and delivery outcomes. Casually performing the whole process of responsible midwifery nursing care is ineffective in relieving labor pain, and cannot improve the emotional state of mothers. Guided labor accompaniment is a humanized mode of delivery care, in which nursing staff accompany mothers throughout the delivery and give necessary psychological support, which then relieves pain and promotes the delivery of the fetus through specialized guided labor measures. The combination of full-responsibility midwifery and guided labor accompaniment can realize the synergistic effect of the two programs, which can help improve the physical and mental state of pregnant women and reduce the incidence of adverse pregnancy outcomes.

The results of this study show that the duration of labor and the rate of spontaneous delivery in the study group were better than those in the control group, suggesting that the full-responsibility system of midwifery together with the guided labor accompaniment can shorten the duration of labor and improve the rate of spontaneous delivery. Analyzing the related reasons, under the full-responsibility system of midwifery nursing intervention, nursing staff establish one-to-one service relationships with mothers, which can provide professional delivery care services for mothers and timely deal with abnormalities during labor, but cannot relieve pain during labor, and the psychological state of mothers is not in place, which leads to low maternal nursing compliance, and thus affects the duration of labor and the rate of spontaneous delivery [8,9]. Under the mode of guided labor accompaniment, nursing staff accompany the pregnant women throughout the labor and delivery, and through the comprehensive use of technical support, psychological intervention, experience explanation, etc., it can improve the negative emotions of the pregnant women, relieve the pain of contractions, accelerate the process of delivery of the fetus, and improve the nursing care adherence of mothers to establish confidence in natural delivery, thus improving the rate of natural delivery [10,11]. The results of this study showed that the incidence of adverse pregnancy outcomes in the study group was lower than that in the control group, and nursing satisfaction was higher than that in the control group, suggesting that total responsible midwifery

with guided labor accompaniment can improve pregnancy outcomes and nursing satisfaction. The reason is that full-responsibility midwifery nursing can provide professional nursing services such as labor monitoring, abnormality disposal, delivery, and other nursing services to ensure the safety of the delivery process [12,13]. On the other hand, guided labor can provide physiological and psychological support for mothers, measures such as the guided ball, Lamaze breathing method, and massage can reduce the pain of contractions, psychological comfort and health guidance can improve the emotional state of mothers, so that they can breathe correctly and exert, thus reducing the incidence of adverse pregnancy outcomes and improving the maternal satisfaction with nursing services [14,15].

From the aforementioned analysis, it can be seen that full-responsibility midwifery with guided labor accompaniment can shorten the duration of labor, increase the rate of spontaneous delivery, reduce the incidence of adverse pregnancy outcomes, and achieve a high degree of satisfaction with maternal care, hence it has the value of popularization and application. However, the number of women enrolled in this study was relatively small, the analysis process still needs to be improved and adjusted, no multi-center comparative analysis of the same type of study has been carried out, and the study has been conducted for a relatively short period of time, thus the mechanisms related to the full-responsibility system of assisted delivery with the guided labor accompaniment require in-depth study and analysis.

Disclosure statement

The author declares no conflict of interest.

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Efficacy Analysis of Misoprostol Tablets for Painless Abortion

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Abstract: *Objective:* To analyze the application value of misoprostol tablets in painless abortion. *Methods:* 40 patients who received painless abortion from January 2022 to August 2023 were randomly divided into two groups; those who received misoprostol tablets before the operation were included in group A, and those who did not use misoprostol tablets before the operation were included in group B. Differences in cervical laxity, cervical dilatation time, uterine aspiration time, surgical blood loss, complications, and satisfaction were recorded. **Results:** The excellent and good rate of cervical dilation in group A was higher than that in group B ($P < 0.05$); the dilatation time, uterine suction time, surgical blood loss, and other indicators in group A were better than those in group B ($P < 0.05$); the complication rate after abortion in group A was lower than that of group B ($P < 0.05$); satisfaction rate in group A was higher than that of group B ($P < 0.05$). *Conclusion:* Oral administration of misoprostol tablets before painless abortion can relax the cervix, shorten the dilation time of the cervix, reduce intraoperative bleeding, and have higher patient satisfaction.

Keywords: Painless abortion; Misoprostol tablets; Efficacy

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1. Introduction

Artificial abortion performed under intravenous anesthesia is painless as the patients fall asleep during the operation. During the painless abortion, anesthesia is given 10 minutes before the operation, and the patients are awake after the operations have been completed, hence it is suitable for patients with fear of pain, re-pregnancy after cesarean section, first pregnancy, or high mental stress [1]. However, during painless abortion, it is difficult to dilate the uterus due to the tightness of the patient's cervix. Therefore, cervical dilation drugs can be given before the operation to reduce the complication risks. Misoprostol tablets can soften the cervix and stimulate uterine contractions, reduce uterine tension and pressure, increase the amplitude of uterine contractions, and ensure the safety of induced labor. This article reported 40 patients who underwent painless abortions from January 2022 to August 2023 to explore the therapeutic value of misoprostol tablets.

2. Materials and methods

2.1. General information

A total of 40 patients who underwent painless abortions from January 2022 to August 2023 were randomly divided into two groups. There was no difference in the data of patients undergoing painless abortion between groups A and B ($P > 0.05$), as shown in **Table 1**.

Table 1. Data analysis of patients undergoing painless abortion

Group	Age (years)		Pregnancy (times)		Gestational age (weeks)	
	Range	Average	Range	Average	Range	Average
Group A ($n = 20$)	21–44	28.14 ± 2.46	1–4	2.41 ± 0.33	5–8	7.28 ± 0.51
Group B ($n = 20$)	21–45	28.16 ± 2.51	2–5	2.43 ± 0.36	5–9	7.31 ± 0.53
χ^2 / t	0.0254		0.1831		0.1824	
P	0.9798		0.8557		0.8562	

2.2. Inclusion and exclusion standards

The inclusion criteria included patients who underwent ultrasound confirming intrauterine pregnancy, had indications for painless abortion, signed informed consent, and pregnancy of 5–10 weeks.

The exclusion criteria included patients with contraindications to painless abortion, patients with organ dysfunction, patients with cardiovascular diseases, and patients with mental disorders.

2.3. Treatment methods

No food or water was given to the groups 6 hours before surgery, and intravenous anesthesia was performed.

Group A took misoprostol tablets (China Resources Zizhu Pharmaceutical Co. Ltd.) orally, 1–3 hours before the operation, at a dose of 600 μg. After administration, the operation time was determined based on the actual situation of the patients.

Group B was not given misoprostol tablets, and the remaining abortion procedures were the same as group A.

2.4. Observation indicators

The observation indicators in this study included:

(1) Cervical dilation: If the uterus and cervix were completely relaxed, uterine dilatation was not required during the operation, and the insertion of the no. 8 dilator was smooth, then graded as excellent; if the uterus and cervix were relaxed, the insertion of the no. 7 dilator was smooth but there was resistance in the insertion of the no. 8 dilator, then graded as good; if the uterus and cervix were not relaxed, the dilation of the uterus was difficult, and the insertion of dilator no. 5 and below was difficult, then graded as poor.

(2) Surgical indicators: Record the cervical dilation time, uterine aspiration time, surgical bleeding volume, and other indicators.

(3) Surgical complications: Record infections, abortion syndrome, missed aspiration, and incomplete aspiration.

(4) Surgical satisfaction: Utilize self-made painless abortion satisfaction scale evaluation.

2.5. Statistical analysis

The data of patients undergoing painless abortion were processed with SPSS 21.0, the count data of patients

undergoing painless abortion was recorded as % and the χ^2 test was used, the measurement data of patients undergoing painless abortion was recorded as mean ± standard deviation (SD) and the *t*-test was used. There is a statistical difference if $P < 0.05$.

3. Results

3.1. Analysis of cervical dilation

Table 2 shows the rate of cervical dilation graded as excellent and good in group A was 95.00%, which was higher than in group B (55.00%; $P < 0.05$)

Table 2. Comparison of cervical dilation [*n* (%)]

Group	Excellent	Good	Poor	Excellent rate
Group A (*n* = 20)	14 (70.00)	5 (25.00)	1 (5.00)	95.00
Group B (*n* = 20)	7 (35.00)	4 (20.00)	9 (45.00)	55.00
χ^2	-	-	-	8.5333
P	-	-	-	0.0035

3.2. Analysis of surgical indicators

The cervical dilatation time of 17.08 ± 0.41 s, uterine aspiration time of 1.39 ± 0.32 min, and surgical bleeding volume of 15.25 ± 1.25 mL were recorded in group A patients who underwent painless abortion, which all values were better as compared to those in group B ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of surgical indicators (mean ± SD)

Group	Cervical dilation time (s)	Suction time (min)	Surgical blood loss (mL)
Group A (*n* = 20)	17.08 ± 0.41	1.39 ± 0.32	15.25 ± 1.25
Group B (*n* = 20)	70.36 ± 1.36	2.68 ± 0.49	27.88 ± 2.36
t	167.7455	9.8577	21.1500
P	0.0000	0.0000	0.0000

3.3. Analysis of surgical complications

Table 4 shows the complication rate of abortion in group A was 5.00%, which was lower than in group B (30.00%, $P < 0.05$).

Table 4. Comparison of surgical complications [*n* (%)]

Group	Infection	Abortion syndrome	Leak suction and empty suction	Insufficiency of uterine aspiration	Incidence rate
Group A (*n* = 20)	0 (0.00)	1 (5.00)	0 (0.00)	0 (0.00)	5.00
Group B (*n* = 20)	1 (5.00)	2 (10.00)	0 (0.00)	3 (15.00)	30.00
χ^2	-	-	-	-	4.3290
P	-	-	-	-	0.0375

3.4. Analysis of surgical satisfaction

The surgical satisfaction rate of abortion in group A was 100.00%, which was higher than in group B (80.00%, $P < 0.05$), as shown in **Table 5**.

Table 5. Comparison of surgical satisfaction [*n* (%)]

Group	Satisfied	Generally satisfied	Not satisfied	Satisfaction rate
Group A (*n* = 20)	12 (60.00)	8 (40.00)	0 (0.00)	100.00
Group B (*n* = 20)	6 (30.00)	10 (50.00)	4 (20.00)	80.00
χ^2	-	-	-	4.4444
P	-	-	-	0.0350

4. Discussion

Painless abortion is an effective remedy for contraceptive failure. It is suitable for treating patients within ten weeks of pregnancy and termination through intravenous anesthesia, including superconducting visual abortion, double-chamber decompression abortion, and microtube visual abortion, with the advantages of high safety, short onset of effect, and low risk of side effects. It can reduce the pain caused by abortion operations and relieve patients' physical and mental stress. When carrying out a painless abortion, the anesthetic dose is determined based on the patient's weight and height. The patient can be awakened within 3 minutes after the operation, and the risk of side effects is low. However, due to the individual differences of abortion patients and external factors, some patients require increased anesthesia. Unable to fall asleep after taking an increased dose may result in limited surgical operation and increased intraoperative bleeding. Therefore, the choice of drugs for complete anesthesia remains a hot topic in clinical research and directly affects the efficacy of surgery [2]. Currently, propofol is mainly used as an anesthetic drug in clinical practice. It has central sedative and hypnotic effects. When administered intravenously, it can exert its effects continuously and stably. After administration, it can cause patients to enter deep sleep and relax the muscles. However, propofol has no cervical dilation effect, so for patients with great difficulty in dilatation and poor cervical conditions, cervical dilation drugs need to be given before surgery to ensure the smooth progress of the surgery. In addition, the following side effects may occur during propofol anesthesia: (1) transient apnea and hypotension, which can be relieved by adjusting the propofol administration rate during the maintenance period; and (2) local pain, which can be relieved by giving lidocaine intravenously.

The key to ensuring the orderly advancement of painless abortion is to dilate the cervix. If no corresponding drugs are given before the operation, and only a dilator is used to perform the uterine dilation operation, it can increase the patient's pain and cause cervical lacerations. Therefore, this study chose misoprostol tablets to complete cervical dilation. Misoprostol tablets are prostaglandin E1 derivatives, which are suitable for stimulating cervical ripening and anti-early pregnancy treatment. They can exert specific effects in the uterus and cervical area and continue to stimulate cervical connective tissue, increasing protease release, and promoting the degradation of collagen fibers, leading to the dilation of the cervix. In addition, oral administration of misoprostol tablets can stimulate uterine smooth muscle, strengthen uterine contraction, and dilate the cervix based on exciting uterine muscles. Relevant literature reports that the high blood concentration of misoprostol after oral administration can stimulate uterine contraction and shorten the cervical ripening time, which is helpful for patients to complete induction of labor and abortion successfully [3].

From a pharmacological perspective, misoprostol tablets are synthetic prostaglandin I derivatives that inhibit the body's secretion of gastric acid. It also has the pharmacological effects of prostaglandins, which can regulate intrauterine pressure, stimulate cervical contraction, and soften the cervix [4]. In addition, giving mifepristone based on misoprostol tablets can increase the frequency of uterine contractions, expand the

amplitude of uterine contractions, and have the effect of terminating early pregnancy [5]. Compared with carboprost methylate and thiopentone, misoprostol is safer, has milder adverse reactions, a higher absorption rate of active ingredients, and a higher rate of binding to plasma proteins. Based on the pharmacokinetic analysis of misoprostol tablets, the blood concentration reaches the peak 15 minutes after administration, and the active ingredients can be fully absorbed 1.5 hours after administration. Based on clinical practice analysis, misoprostol has a protein binding rate of 80%–90% and a clearance half-life of 20–40 minutes, making it suitable for cervical dilation treatment before painless abortion [6].

Based on the data analysis in this article, the excellent and good rate of cervical dilation in group A patients undergoing abortion was 95.00%, which was higher than that in group B (55.00%, $P < 0.05$), thus suggesting that giving misoprostol tablets before a painless abortion can enhance the cervical dilation effect. Conventional abortion treatment has the disadvantages of a high complication rate, long operation time, and poor postoperative recovery, which can increase the medical expenses of abortion patients. During routine abortion, it is difficult to dilate the cervix, so it takes a long time to suck out the embryo completely, and the slow dilatation of the cervix increases the difficulty of the operation [7]. In addition, the female cervix has abundant smooth muscles, blood vessels, elastic fibers, nerves, and other structures. If the cervix is not ripened, and the dilator is directly used for surgery, it can cause vagus nerve excitement, increase the secretion of acetylcholine in the human body, and cause pale complexion, chills, miscarriage syndrome such as night sweats, and even secondary uterine perforation, cervical tearing, and other complications, causing severe pain to the patient and affecting the smooth progress of the operation. Similarly to first-time pregnancy, the risk of secondary cervical-related complications is low when the cervix is dilated during abortion, so the cervix should be ripened in advance to reduce the difficulty of cervical dilation and ensure the success of negative aspiration [8]. The results in this article showed that misoprostol has excellent medicinal effects of dilating the cervix, stimulating uterine contraction, and relaxing the cervix.

Preoperative administration of misoprostol can reduce the difficulty of abortion. Another set of data showed that the cervical dilation time was 17.08 ± 0.41 s, uterine suction time was 1.39 ± 0.32 min, surgical blood loss was 15.25 ± 1.25 mL, and other indicators of abortion patients in group A were better than those in group B (70.36 ± 1.36 s, 2.68 ± 0.49 min, 27.88 ± 2.36 mL, respectively, $P < 0.05$). This indicated that giving misoprostol tablets before surgery can reduce bleeding during abortion and shorten the time of mechanical stimulation of the uterine cavity. Oral administration of misoprostol tablets can stimulate cervical fibroblasts, promote collagen fibers' degradation, change collagen fibers' order, and achieve efficient cervical dilation. Another set of data showed that the complication rate of abortion in group A was 5.00%, which was lower than that in group B, which was 30.00% ($P < 0.05$), hence indicating that giving misoprostol tablets before surgery can reduce surgical complications. As misoprostol is administered orally, the local drug concentration is high. In addition, the drug has high bioavailability, and its effect is not affected by fasting, hence it can rapidly dilate the cervix with low operation difficulty [9]. Moreover, for those without a history of vaginal delivery, giving misoprostol before surgery can promote the separation of the embryo from the uterine wall, thereby reducing the difficulty of negative pressure suction and reducing the damage to the uterine wall. Therefore, the postoperative complication rate is low [10]. The last data set shows that group A's satisfaction rate for abortion is 100.00%, which was higher than group B's (80.00%, $P < 0.05$). It shows that preoperative misoprostol tablets ripen the cervix and can enhance patient satisfaction with abortion. The reason is that misoprostol tablets have vigorous pharmacological activity and can play a similar role as E prostanoids. When administered orally, the active ingredients are well absorbed and can ripen the cervix. Therefore, it can be used before abortion to reduce the pain of abortion as well as avoid postoperative complications such as cervical injury, adhesion, and

uterine perforation [11]. Nevertheless, giving misoprostol tablets before a painless abortion may cause symptoms of lower abdominal distension and pain, but most patients can tolerate it and generally do not need special treatment.

In summary, administering misoprostol before a painless abortion can relax the uterine wall, promote embryo exclusion, and reduce cervical and uterine wall damage, thereby improving the safety of painless abortion, which has promotional value.

Disclosure statement

The author declares no conflict of interest.

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Examining the Influence of Accompanying Midwifery with Position Guidance on Delivery Outcomes

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Abstract: *Objective:* To explore and analyze the influence of accompanying midwifery with position guidance on delivery outcomes. *Methods:* A total of 68 puerpera who were admitted to Dafeng People's Hospital from April 2021 to April 2023 were recruited, grouped using odd and even number draw methods, and divided into cooperation and regular groups with 34 cases in each group. The patients in the cooperation group cooperated with the process of accompanying midwifery and position guidance, whereas the patients in the regular group had routine midwifery intervention. The delivery outcome, the duration of each labor process, the psychological state, and the amount of postpartum hemorrhage were compared between the groups. *Results:* The delivery outcomes of vaginal delivery and cesarean section in the cooperation group were significantly better than those in the regular group ($P < 0.05$). The difference was not statistically significant when comparing the cooperation group with the regular group through a lateral vaginal incision ($P > 0.05$). The duration of each labor process in the cooperation group was significantly shorter than in the regular group ($P < 0.05$). Before the intervention, the HAMD and HAMA scores of the two groups were insignificant ($P > 0.05$); but the HAMD and HAMA scores of the cooperation group were significantly lower than the regular group after the intervention ($P < 0.05$). The amount of postpartum bleeding in the cooperation group was markedly lower than that in the regular group ($P < 0.05$). *Conclusion:* Accompanying midwifery and position guidance throughout the delivery process can improve delivery outcomes and increase the natural delivery rate.

Keywords: Accompanying midwifery throughout the whole process; Position guidance; Delivery outcome

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1. Introduction

Childbirth is a unique physiological activity for women that must go through three labor stages. Reasonable nursing cooperation can promote the smooth progress of labor [1,2]. If the labor process is too long, it will consume much of the mother's physical strength. The long-term physiological reaction will cause the mother discomfort, adversely impacting the delivery outcome [3]. Full-course midwifery is a new model that provides maternal services throughout the entire labor process and has particular value for the mother's psychology, pain, and delivery outcomes [4,5]. Position guidance can effectively relieve the pain of uterine contractions and change

the fetus's position to prepare for natural delivery. This paper will study and analyze the influence of full-time accompanying midwifery and position guidance on delivery outcomes.

2. General information and methods

2.1. General information

A total of 68 parturients who were admitted to the Department of Obstetrics and Gynecology, Dafeng People's Hospital from April 2021 to April 2023 were recruited. They were divided into cooperation and regular groups, with 34 cases in each group, by drawing lots with odd and double numbers. The age in the cooperation group ranged from 23 to 37 years old, with an average age of 30.57 ± 2.43 years; gestational weeks ranged from 37 to 42 weeks, with an average gestational age of 39.58 ± 1.24 weeks. The age in the regular group ranged from 22 to 37 years old, with an average age of 30.41 ± 2.56 years; gestational weeks were 38 to 42 weeks, with an average gestational age of 39.82 ± 1.34 weeks. There was no statistically significant difference between the groups in age, gestational weeks, and other general information ($P > 0.05$).

Inclusion criteria included patients who meet the indications for natural delivery, voluntarily participate in research, and with barrier-free communication.

Exclusion criteria included patients with obesity, chronic diseases, and mental illnesses.

2.2. Methods

The regular group received routine midwifery intervention: the nursing staff accompanied the mothers throughout the process and explained the childbirth knowledge to the mothers during this period to comfort the mothers' emotions. The nursing staff also detected all signs of puerpera and implemented fetal heart rate monitoring.

The patients in the cooperation group received accompanying midwifery during the whole process and position guidance:

(1) Accompanying midwifery throughout the process: After the mother was admitted to the hospital, the mother's condition was comprehensively assessed, and delivery education was given to help her understand childbirth correctly. A warm service attitude was upheld and the strangeness between nurses and patients was eliminated. Soothing music was played in the room to stabilize the mother's mood. The emotional changes of the parturients were paid attention to. Advice was given promptly by the midwives when the parturients had negative emotions. The mothers were encouraged to eat sufficient food to provide the body with sufficient energy and prepare for childbirth, followed by draining the urine and keeping the bladder empty. When the cervix was dilated to 3 cm, the mothers were brought into the delivery room. At this time, various indicators of the mother and fetus were closely monitored, focusing on tracking the expansion of the mother's cervix to judge the progress of labor correctly. When entering the second stage of labor, mothers were taught to use abdominal pressure that can reduce the damage to the vagina caused by the delivery of the fetus. After the fetus was delivered, the newborn was assessed and brought into intimate contact with the mother. After the placenta was entirely removed from the body, the uterus of the parturient was massaged, and vital signs and postpartum hemorrhage were detected.

(2) Position guidance: In the first stage of labor, the mothers were encouraged to move independently, and the mothers' upper body could be tilted forward to take a standing position. This position can change the position of the fetal head. In the process of standing, swinging the hips left and right can relieve the pain of uterine contractions to a certain extent. A birthing ball of appropriate size was prepared

and allowed the mother to sit on the birthing ball and swing her body with the frequency of uterine contractions. Maternal women with lower back pain had soft pillows on the stool, and the midwife helped the mothers with massaging the lower back to relieve pain. After the labor process entered the active stage, the position of the fetal head was assessed. Abnormal fetal position can be corrected by positioning, as the mother laid on her side on the bed, with legs supported with a pillow in between, and using gravity to guide the change in fetal position.

2.3. Observation indicators

The observation indicators of this study included:

(1) The delivery outcomes were compared between the groups, including vaginal delivery, cesarean section, and colpotomy.

(2) The time of each stage of labor was compared between the groups, including the first, second, and third stages of labor.

(3) The psychological state between the groups was compared, and the Hamilton depression scale (*HAMD*) and the Hamilton anxiety scale (*HAMA*) were used to evaluate. The higher the score, the more severe the depression/anxiety.

(4) The amount of postpartum hemorrhage between the groups was compared, including the amount of postpartum hemorrhage at 2 hours and 24 hours.

2.4. Statistical analysis

SPSS 21.0 statistical software was selected to process and analyze the data. The count data were expressed by the number of cases (n) and percentage (%), and the χ^2 test was implemented. The mean ± standard deviation (SD) was described in the measurement data, and the t-test was implemented. $P < 0.05$ was considered as a statistically significant difference.

3. Results

3.1. Comparing the delivery outcomes between the cooperation group and the regular group

The delivery outcomes of vaginal delivery and cesarean section in the cooperation group were significantly better than those in the regular group ($P < 0.05$); there was no statistically significant difference in colpotomy between the cooperation group and the regular group ($P > 0.05$). See **Table 1** for details.

Table 1. Comparison of delivery outcomes between groups [n (%)]

Group	Number of cases	Vaginal delivery	Cesarean section	Colpotomy
Cooperation group	34	22 (64.71)	7 (20.59)	5 (14.71)
Regular group	34	13 (38.24)	15 (44.12)	6 (17.65)
χ^2 value	-	4.7688	4.3004	0.1085
P value	-	0.0289	0.0381	0.7419

3.2. Comparing the duration of each labor process between the cooperation group and the regular group

Table 2 shows that the duration of each labor process in the cooperation group was significantly shorter than that in the regular group ($P < 0.05$).

Table 2. The time comparison of each labor process between the groups (mean ± SD)

Group	Number of cases	The first stage of labor	The second stage of labor	The third stage of labor	Total labor time
Cooperation group	34	308.69 ± 16.87	30.87 ± 6.73	7.17 ± 2.57	346.73 ± 26.17
Regular group	34	383.41 ± 27.51	43.51 ± 9.34	11.94 ± 2.62	438.86 ± 39.47
t value	-	13.5010	6.4022	7.5785	11.3448
P value	-	0.0000	0.0000	0.0000	0.0000

3.3. Compare the psychological state of the cooperation group and the regular group

Before the intervention, the HAMD and HAMA scores of the two groups were not statistically significant ($P > 0.05$). After the intervention, the HAMD and HAMA scores of the cooperation group were significantly lower than those of the regular group ($P < 0.05$). See **Table 3** for details.

Table 3. Comparison of psychological states between groups (mean ± SD)

Group	Number of cases	HAMD score		HAMA score	
		Before intervention	After intervention	Before intervention	After intervention
Cooperation group	34	23.57 ± 2.75	14.25 ± 2.07	22.41 ± 2.34	15.24 ± 2.37
Regular group	34	23.48 ± 2.52	18.32 ± 2.63	22.57 ± 2.53	20.85 ± 2.63
t value	-	0.1406	7.0907	0.2707	9.2397
P value	-	0.8885	0.0000	0.7875	0.0000

3.4. Compare the amount of postpartum bleeding between the cooperation group and the regular group

Table 4 shows the amount of postpartum hemorrhage in the cooperation group was significantly lower than in the regular group ($P < 0.05$).

Table 4. Comparison of postpartum hemorrhage volume between groups (mean ± SD)

Group	Number of cases	Bleeding volume 2 hours after delivery (mL)	Bleeding volume 24 hours after delivery (mL)
Cooperation group	34	163.49 ± 18.27	329.57 ± 55.23
Regular group	34	220.54 ± 20.69	420.35 ± 60.45
t value	-	12.0518	6.4644
P value	-	0.0000	0.0000

4. Discussion

Childbirth is the process of separating the fetus from the mother's body. It is divided into three stages, namely the three stages of labor: the cervical dilation stage, fetal delivery, and placental delivery [6,7]. Childbirth is a relatively long process, and the mother will be accompanied by severe uterine contraction pain, which can easily lead to psychological stress, such as fear and anxiety, which will eventually affect the delivery outcome and even cause neonatal complications [8,9]. Nursing interventions are provided during childbirth to help the mothers go through the labor process smoothly and complete the childbirth. The conventional nursing mode focuses on treating puerpera, and the intervention effect on pain and psychology is relatively weak, hence a new nursing mode needs to be introduced. The process of accompanying midwifery is a "one-on-one" nursing

model, which provides complete delivery care for the parturient when admitted to the hospital. Implementing full companionship can create a comfortable delivery environment for mothers and protect the safety of mothers and babies. This nursing model reduces the psychological burden of the patient and negative emotions through psychological counseling, which can reduce maternal and infant complications [10]. Position guidance is a way to reduce maternal pain. During labor, the mothers are guided to change different postures to ease the pain of uterine contractions [11,12]. This nursing model is relatively simple and readily accepted by mothers. It will neither increase mothers' discomfort during the implementation process nor affect the safety of mothers and infants [13]. Position guidance can also correct the position of the fetus, promote the descent of the head, speed up the time of dilation of the cervix, and shorten the labor time [14].

The results of the experiment are as follows: the vaginal delivery and cesarean section delivery outcomes of the cooperation group were significantly better than those of the regular group ($P < 0.05$); there was no significant difference in colpotomy between the cooperation group and the regular group ($P > 0.05$). The duration of each labor process in the cooperation group was significantly shorter than that in the regular group ($P < 0.05$). Before the intervention, the HAMD and HAMA scores of the two groups were insignificant ($P > 0.05$); after the intervention, the HAMD and HAMA scores of the cooperation group were significantly lower than the regular group ($P < 0.05$). The amount of postpartum hemorrhage in the cooperation group was significantly lower than in the regular group ($P < 0.05$). With full-course accompanying midwifery and position guidance, most women complete their childbirth through natural vaginal delivery. Natural birth is conducive to the mother's postpartum recovery and reduces postpartum complications. The duration of the labor process is shortened significantly, and the psychological state of the parturient has been improved, which has a positive significance on the delivery outcome [15].

To sum up, the application of accompanying midwifery throughout the whole process and position guidance in maternal delivery can reduce the chance of cesarean section, and the delivery outcome is excellent. This mode of midwifery is worthy of wide application and promotion in clinics.

Disclosure statement

The author declares no conflict of interest.

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Examining the Impact of the Whole-Process Companionship and Responsible Midwifery Model on Delivery Outcomes

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Abstract: *Objective:* To explore and analyze the impact of the whole-process companionship and responsible midwifery model on delivery outcomes. *Methods:* 200 women who were about to give birth admitted to Lianyungang Maternal and Child Health Hospital's Obstetrics and Gynecology Department from May 2021 to May 2023 were recruited and divided into whole process and ordinary groups by flipping a coin, with 100 cases in each group. The whole process group implemented the whole process companionship and responsible midwifery model, while the ordinary group implemented the conventional midwifery model. The duration of labor, delivery outcomes, psychological status, postpartum bleeding volume, and incidence of adverse neonatal outcomes were compared between groups. *Results:* All three stages of labor in the whole process group were significantly shorter than those in the ordinary group ($P < 0.05$). The natural delivery rate and cesarean section rate in the whole process group were significantly better than those in the ordinary group ($P < 0.05$). The difference was not statistically significant after comparing the lateral incision rate between the whole process group and the ordinary group ($P > 0.05$). Before the intervention, the anxiety and depression scores between the groups were similar ($P > 0.05$); after the intervention, the anxiety and depression scores in the whole process group were significantly lower than in the ordinary group ($P < 0.05$). The amount of postpartum hemorrhage and the incidence of adverse neonatal outcomes in the whole process group were significantly better than those in the ordinary group ($P < 0.05$). *Conclusion:* The whole-process companionship and responsible midwifery model has specific positive significance for delivery outcomes, and this midwifery model deserves to be widely used and promoted in clinical practice.

Keywords: Whole-process companionship and responsible midwifery model; Delivery outcome; Maternal

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1. Introduction

Childbirth is a physiological process for women that defines the separation of the fetus from the mother's body. Childbirth is divided into three stages that are commonly known as the three stages of labor. The labor progress will be accompanied by uterine contractions, which will bring a certain amount of pain to the mother. The mother is prone to anxiety, fear, and other negative emotions, which will affect the outcome of the birth [1]. Natural delivery is very beneficial to both the mother and the fetus, but many mothers choose cesarean section

for delivery. The recovery period of cesarean section is long, there is a risk of infection after surgery, and it also increases the incidence of postpartum complications. Therefore, intervention measures must be provided to ensure the safety of mothers and infants [2]. The conventional midwifery model can meet the basic needs of parturients but has a small intervention effect on delivery outcomes [3]. The whole-process companionship and responsible midwifery model is a new midwifery model that provides mothers with basic delivery needs, meets physical, physiological, and emotional needs, and has a particular influence on the delivery outcome [4]. This article aims to study and analyze the impact of the whole-process companionship and responsible midwifery model on birth outcomes.

2. General information and methods

2.1. General information

Two hundred women who were about to give birth admitted to Lianyungang Maternal and Child Health Hospital's Obstetrics and Gynecology Department from May 2021 to May 2023 were recruited and divided into whole process and ordinary groups by flipping a coin, with 100 cases in each group. In the whole process group, the youngest was 23 years old, and the oldest was 36 years old, with an average age of 29.64 ± 1.58 years; there were 39 primiparous women and 11 multiparous women; the shortest gestational age was 37 weeks, and the most extended gestational age was 42 weeks, with an average gestational age of 39.56 ± 1.52 weeks. In the ordinary group, the youngest was 24 years old, and the oldest was 37 years old, with an average age of 29.32 ± 1.63 years; there were 40 primiparous women and 10 multiparous women; the shortest gestational age was 38 weeks, and the most extended gestational age was 41 weeks, with an average gestational age of 39.35 ± 1.52 weeks. The general information such as age, maternal type, and gestational age between the groups was comparable ($P > 0.05$).

2.2. Methods

The ordinary group implemented the conventional midwifery model: informing mothers of the issues they need to pay attention to during delivery, observing the progress of their labor, and providing them with fetal heart rate monitoring.

The whole process group implemented the whole-process companionship and responsible midwifery model:

(1) Established a whole-process companionship and responsible midwifery team, formulated a training plan, and conducted training and assessment for team members. Team members needed to master the core concepts of this midwifery model, flexibly implement the midwifery measures in this model, and emphasize the concept of humanized service.

(2) When the mother was expecting to give birth, the midwife took note of the mother's situation through communication, took appropriate educational measures according to the mother's situation, and provided the mother with childbirth education. The mother was given the pros and cons of natural delivery and cesarean section, and mastering the characteristics of each stage of labor. Some ways were taught to the mother to reduce pain and guided her to adjust her breathing rhythm so that the mother could form a correct understanding of childbirth. Psychological care was provided to pregnant women, relieving negative emotions, cheering them up, and increasing their self-confidence.

(3) When the mother had frequent uterine contractions, the midwife accompanied her throughout the labor process and explained some of the delivery procedures to eliminate the mother's sense of urgency and restraint. The environment was ensured to be comfortable and quiet, guidance on some delivery techniques was provided, and the mother was taught to exert the correct force, which could promote

the smooth progress of labor. The nurse could massage the mother's waist during uterine contractions, effectively reducing pain. The mother is encouraged to eat sufficient food to preserve her strength and energy for childbirth.

(4) Fetal heart rate monitoring was provided to the mother for close observation of the fetus's condition. In addition, the mother's vital signs and specific conditions were monitored. The mother may request her spouse or family members to accompany her in the delivery room for comfort and encouragement.

(5) During the delivery process, midwives recorded the maternal indicators in detail and made handovers with the ward nurses after delivery. While the mother was hospitalized, midwives visited her regularly to observe her postpartum recovery.

2.3. Observation indicators

The observation indicators of this study included:

(1) The labor time between groups was compared, including the first stage, the second stage, and the third stage of labor.

(2) Delivery outcomes, including natural delivery, cesarean section, and lateral incision, were compared between groups.

(3) The mental state was compared between the groups. The Anxiety Self-Rating Scale assessed anxiety, and the Depression Self-Rating Scale assessed depression. The lower the score, the better the mental state.

(4) The amount of postpartum hemorrhage and the incidence of adverse neonatal outcomes were compared between groups.

2.4. Statistical analysis

SPSS 21.0 statistical software was selected to process and analyze the data. The count data were expressed by the number of cases (n) and percentage (%), and the χ^2 test was implemented. The measurement data were expressed by mean ± standard deviation (SD), and the t-test was implemented. $P < 0.05$ was considered as a statistically significant difference.

3. Results

3.1. Comparison of labor time between the whole process group and the ordinary group

Table 1 shows the duration of the first, second, and third stages of labor in the whole process group was significantly shorter than that of the ordinary group ($P < 0.05$).

Table 1. The comparison of labor time between groups (mean ± SD)

Group	Number of cases	The first stage of labor	The second stage of labor	The third stage of labor
Whole process group	100	246.25 ± 50.65	47.25 ± 23.66	7.63 ± 5.33
Ordinary group	100	325.54 ± 55.96	59.54 ± 26.31	9.86 ± 5.31
t value	-	10.5050	3.4733	2.9639
P value	-	0.0000	0.0006	0.0034

3.2. Comparison of delivery outcomes between the whole process course group and the ordinary group

The rates of natural childbirth and cesarean section in the whole process group were significantly better than

those in the ordinary group ($P < 0.05$). However, the difference was not statistically significant when comparing the lateral incision rate between the whole process group and the ordinary group ($P > 0.05$). See **Table 2** for details.

Table 2. The comparison of delivery outcomes between groups [*n* (%)]

Group	Number of cases	Natural childbirth	Cesarean section	Lateral incision
Whole process group	100	74 (74.00)	11 (11.00)	15 (15.00)
Ordinary group	100	61 (61.00)	27 (27.00)	12 (12.00)
χ^2 value	-	3.8519	8.3171	0.3854
P value	-	0.0496	0.0039	0.5347

3.3. Compare the psychological status of the whole process group and the ordinary group before and after the intervention

Table 3 shows that there were insignificant differences in the anxiety and depression scores between the groups before the intervention ($P > 0.05$); after the intervention, the anxiety and depression scores in the whole group were significantly lower than those in the ordinary group ($P < 0.05$).

Table 3. Comparison of psychological status between groups before and after intervention (mean ± SD, points)

Group	Number of cases	Anxiety		Depression	
		Before intervention	After intervention	Before intervention	After intervention
Whole process group	100	40.21 ± 2.54	27.61 ± 2.86	36.59 ± 2.31	25.49 ± 2.67
Ordinary group	100	40.36 ± 2.61	33.94 ± 2.54	36.57 ± 2.63	29.63 ± 2.86
t value	-	0.4118	16.5486	0.0571	10.5811
P value	-	0.6809	0.0000	0.9545	0.0000

3.4. Compare the amount of postpartum hemorrhage and the incidence of adverse neonatal outcomes between the whole process group and the ordinary group

The amount of postpartum hemorrhage and the incidence of adverse neonatal outcomes in the whole process group were significantly better than those in the ordinary group ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of postpartum hemorrhage volume and incidence of adverse neonatal outcomes between groups (mean ± SD) / [*n* (%)]

Group	Number of cases	Amount of postpartum bleeding (mL)	Incidence of adverse neonatal outcomes
Whole process group	100	331.52 ± 65.24	1 (1.00)
Ordinary group	100	375.23 ± 70.52	7 (7.00)
t / χ^2 value	-	4.5498	4.6875
P value	-	0.0000	0.0303

4. Discussion

Childbirth is a relatively long process, and the duration of the labor process varies from person to person. Many pregnant women will experience negative emotions when facing childbirth, and the uterine contraction

has a strong sense of pain. Maternity bears both physical and psychological pressure [5]. Midwifery is a series of measures implemented to help the fetus deliver to the mother. The conventional model of midwifery can provide primary medical and physiological intervention for the parturient, and the specific implementation measures are relatively limited [6,7]. The whole-process companionship and responsible midwifery model is a new type of assisted delivery mode. In this midwifery mode, one-on-one services can be provided to the parturients, and the parturients can be accompanied all the way [8]. Before implementing this midwifery model, team members were given standardized training to use this measure to promote the delivery of parturients [9]. The whole-process companionship and responsible midwifery model provides two-way support for the puerpera both physically and psychologically, and through the implementation of the midwifery model from multiple angles, the initiative of midwifery is realized [10]. This midwifery model can improve maternal delivery outcomes and reduce the occurrence of cesarean section [11,12].

The experimental results are as follows: all three stages of labor times in the whole process group were significantly shorter than those in the ordinary group ($P < 0.05$). The natural delivery rate and cesarean section rate in the whole process group were significantly better than those in the ordinary group ($P < 0.05$). The difference was not statistically significant after comparing the lateral incision rate between the whole process group and the ordinary group ($P > 0.05$). Before the intervention, the anxiety and depression scores between the groups were comparable ($P > 0.05$); after the intervention, the anxiety and depression scores in the whole process group were significantly lower than in the ordinary group ($P < 0.05$). The amount of postpartum hemorrhage and the incidence of adverse neonatal outcomes in the whole process group were significantly better than those in the ordinary group ($P < 0.05$). The whole-process companionship and responsible midwifery model shortens labor time through practical guidance, and the labor proceeds smoothly. It not only shortens the time consumed by the labor process but also improves the outcome of labor [13,14]. This midwifery model provides psychological guidance to the mother, and the mother's mood change has a specific positive effect on the delivery. The whole-process companionship and responsible midwifery model improves the natural delivery rate, controls postpartum hemorrhage, and ensures the safety of newborns [15].

In summary, the whole-process companionship and responsible midwifery model has a good application effect in maternal delivery which improves delivery outcomes and is worthy of widespread clinical promotion and application.

Disclosure statement

The author declares no conflict of interest.

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Examining Clinical Application Value of Uterine Compression Suture in the Treatment of Postpartum Hemorrhage

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Abstract: *Objective:* To observe and explore the clinical effect of uterine compression sutures in treating postpartum hemorrhage. *Methods:* 56 patients with postpartum hemorrhage were diagnosed and treated from January 2020 to December 2022. According to the coin toss method, they were divided into the conventional group (given routine hemostatic treatment) and the research group (given uterine compression suture), with 28 cases in each group. The hemostatic efficiency, postoperative recovery time, postoperative bleeding volume, and complication rate were compared between the two groups. *Results:* The hemostatic efficiency of the research group was higher than that of the conventional group ($P < 0.05$); the hemostasis time, total hospitalization time, lochia excretion promotion time, and time for the menstrual cycle to return to normal in the research group were shorter than those of the conventional group ($P < 0.05$); the bleeding volume at 2 hours and 24 hours after surgery in the research group was lower than that in the conventional group ($P < 0.05$); the total incidence of complications such as fever, uterine adhesions, incisional bleeding, and fluid dark areas in the research group was lower than that in the conventional group ($P < 0.05$). *Conclusion:* The hemostatic effect of the uterine compression suture is accurate. It stops bleeding quickly and can significantly reduce the amount of perioperative bleeding. It can also reduce postoperative complications and speed up recovery with a specific reference value.

Keywords: Postpartum hemorrhage; Uterine compression suture; Postoperative bleeding volume; Complications

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1. Introduction

Postpartum hemorrhage is a standard delivery complication among pregnant women, that is, the amount of maternal bleeding ≥ 500 mL 24 hours after delivery [1]. This condition is dangerous and critical and is an essential factor leading to the perinatal death of pregnant women. Especially within 2 hours after the mother delivers the fetus, it is a high bleeding period that requires great clinical attention [2]. Postpartum hemorrhage is usually related to many factors, such as placenta implantation, placental adhesion, placenta previa, uterine atony, and soft birth canal injury. It seriously threatens the patient's safety and requires timely and effective hemostatic treatment [3]. Uterine compression suture is a highly recommended hemostasis method in modern clinical obstetrics, including B-lynch suture, lower uterine segment compression/constriction suture, Cho

suture, and Hayman suture. It mainly uses squeezing and binding. The uterine wall and other operations are used to promote local thrombus formation, thereby slowing down the blood flow rate of the uterine artery and achieving hemostasis [4]. Therefore, this study includes 56 patients with postpartum hemorrhage as clinical subjects to observe and explore the efficacy of uterine compression sutures, hoping to provide evidence-based support for treating patients with postpartum hemorrhage effectively.

2. General information and methods

2.1. General information

Fifty-six patients with postpartum hemorrhage were diagnosed and treated from January 2020 to December 2022. They were divided into the conventional group (n = 28) and the research group (n = 28) using the coin-tossing method. The patients with postpartum hemorrhage in the conventional group had cesarean section, aged 23–33 years old with an average age of 28.47 ± 3.52 years; gestational age of 37–40 weeks with an average of 38.68 ± 0.62 weeks; 10 were multiparous women and 18 were primiparous women; 12 cases of uterine inertia and bleeding, 4 cases of original scar incision bleeding, 6 cases of soft birth canal injury bleeding, and 6 cases of placental factor bleeding. All patients with postpartum hemorrhage in the research group had cesarean section, aged 22–35 years old with an average age of 28.49 ± 3.55 years; gestational age of 37–39 weeks with an average of 38.66 ± 0.31 weeks; 11 were multiparous women and 17 were primiparous women; 10 cases of uterine atony bleeding, 5 cases of original scar incision bleeding, 7 cases of soft birth canal injury bleeding, and 6 cases of placental factor bleeding. There was no statistical difference in general information such as age, gestational age, mode of delivery, delivery history, and causes of bleeding between the two groups of patients with postpartum hemorrhage ($P > 0.05$).

Inclusion criteria included patients with postpartum hemorrhage confirmed by clinical obstetrics and gynecology examination according to "Practical Gynecology" [5], patients with singleton term pregnancy and delivery, patients with normal coagulation function, and patients with informed consent to this study.

Exclusion criteria included patients with gestational diabetes and hypertension, heart, liver, and kidney insufficiencies, infectious diseases, mental illness, and autoimmune diseases.

2.2. Methods

Twenty-eight patients with postpartum hemorrhage in the conventional group were given routine hemostatic treatment, including gentle massage of the uterus to promote recovery of uterine contractions, removal of retained objects and removal of the placenta, filling of the uterine cavity with gauze or uterine balloon-soaked in hot saline, injection of oxytocin and addition of powerful uterotonic agents such as ergometrine or uterine, application of tranexamic acid to stop bleeding, suture of patients with damaged soft birth canals, and ligation of bilateral uterine arteries or removal of the uterus if necessary to stop bleeding.

In addition to the above measures, 28 patients with postpartum hemorrhage in the research group were also given uterine compression sutures, including:

(1) B-lynch sutures: mainly used for bleeding caused by uterine contraction weakness and excessive placental attachment surface. The needle was inserted 3 cm below the uterine incision and 3 cm from the left edge of the uterus. The needle was then taken at 3 cm above the uterine incision and about 4 cm from the left edge of the uterus. The fundus was crossed backward, and the fundal ligaments were sewed in between and penetrated at a symmetrical point on the right outside. The fundus of the uterus was crossed forward, the right side of the uterus was sutured in the same way, and the sutures were adjusted so that they were symmetrically distributed on the surface of the uterus like overalls.

The sutures were then tightened below the incision, and an assistant was recruited to help compress the uterine body while tying the knot so that there was no mobility. After bleeding, the incision was closed routinely. After the suturing, the uterus was placed in the cavity, and the abdomen was closed if there was no abnormality.

(2) Lower uterine segment compression/constriction sutures: mainly used for bleeding caused by contraction weakness of the lower uterine segment and excessive weakness of the original scar tissue. The peritoneum of the bladder was pushed down and folded to expose the lower uterine segment fully. The descending branches of both uterine arteries were ligated at the level of the internal os of the cervical histology. Then, either the weak lower uterine segment anterior wall or posterior wall was sutured in parallel interrupted rows and knotted on the uterine serosal surface. During interrupted suturing, the front and back walls were fully sutured without penetrating the uterus. Usually, the needle was inserted into the myometrium for 2.5–3.0 cm, and then the needle was removed and knotted to speed up the suturing speed and enhance the compression effect. This suturing method is effective in treating bleeding caused by placenta previa as it is often located in the lower segment of the uterus near the internal os of the cervix.

(3) Cho sutures: suitable for local active bleeding in the uterine cavity. The first needle was inserted into the site of severe uterine bleeding and penetrated the front and back walls of the uterus; then sutured the front and back walls of the uterus 2–3 cm from the exit point of the first needle; the needle was inserted 2–3 cm from one side of the needle and sutures through the front and back walls of the uterus; the needle was inserted 2–3 cm from the exit point of the third needle and sutures through the front and back walls of the uterus. The sutures were knotted and the incision was closed after confirming no active bleeding. If bleeding occurs at the site of placental adhesion, multiple full-thickness square sutures can be performed at the site.

(4) Hayman sutures: modified B-lynch sutures. The bladder's peritoneum was pushed down and folded to fully expose the uterus's lower segment. The needle insertion point was 1–2 cm from the right edge of the uterus and 1–2 cm from the right lower edge of the uterine incision. A straight needle and no. 1 thread were used to penetrate the front and back walls of the uterus and then went around the fundus of the uterus, followed by tying the sutures. The left side was treated similarly. The incision was closed after confirming that there was no active bleeding.

2.3. Observation indicators

The observation indicators of this study included:

(1) Hemostatic efficiency: If the bleeding stopped, all signs were stable, and uterine contractions were effective, it is judged to be markedly effective; if the bleeding volume decreased and was < 50 mL per hour, all signs returned to stable, and the uterine contractions gradually recovered, it is judged to be effective; if the bleeding did not stop and was ≥ 50 mL per hour, the physical signs were still unstable, even continued to worsen, and the uterine contractions had not recovered, so it is judged to be ineffective. Among them, the sum of markedly effective and effective cases accounts for the total effective rate.

(2) Postoperative recovery indicators: Included the hemostasis time, total hospitalization time, lochia excretion promotion time, and time for the menstrual cycle to return to normal.

(3) Postoperative bleeding amount: Included bleeding volume in 2 hours and 24 hours after surgery.

(4) Complications: During hemostatic treatment, patients with postpartum hemorrhage were observed to

have complications such as fever, uterine adhesions, incisional bleeding, and fluid dark areas.

2.4. Data statistical processing

SPSS 22.0 medical software was used to observe the indicators statistically. Count data such as hemostatic efficiency and complication rates of the two groups of patients were described in the form of cases (n) and percentages (%), and the χ^2 test was used to test the data differences between the groups; measurement data such as postoperative recovery indicators including postoperative bleeding volume were described in the form of mean ± standard deviation (SD), and t-test was used to test the data differences between groups; when the test result P value is < 0.05, the difference is statistically significant.

3. Results

3.1. Comparison of hemostatic efficiency between the two groups

Table 1 shows that the hemostatic efficiency of patients with postpartum hemorrhage in the research group was higher than that in the conventional group ($P < 0.05$).

Table 1. Comparison of hemostatic efficiency between two groups [n (%)]

Group	Markedly effective	Effective	Ineffective	Total effective rate
Research group ($n = 28$)	17 (60.71%)	9 (32.14%)	2 (7.14%)	26 (92.86%)
Conventional group ($n = 28$)	13 (46.43%)	7 (25.00%)	8 (28.57%)	20 (71.43%)
χ^2				8.740
P				< 0.05

3.2. Comparison of postoperative recovery indicators between the two groups

The hemostasis time, total hospitalization time, lochia excretion promotion time, and time for the menstrual cycle to return to normal in the research group were shorter than in the conventional group ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of postoperative recovery indicators between the two groups (mean ± SD)

Group	Hemostasis time (min)	Total hospitalization time (d)	Lochia excretion promotion time (weeks)	Time for the menstrual cycle to return to normal (months)
Research group ($n = 28$)	1.33 ± 0.16	5.15 ± 0.99	5.08 ± 1.11	4.45 ± 1.17
Conventional group ($n = 28$)	3.05 ± 0.12	7.35 ± 0.92	9.34 ± 1.38	7.85 ± 1.62
t	8.096	6.342	7.202	5.189
P	< 0.05	< 0.05	< 0.05	< 0.05

3.3. Comparison of postoperative bleeding volume between the two groups

Table 3 shows that the bleeding volume 2 hours and 24 hours after surgery in the research group was lesser than in the conventional group ($P < 0.05$).

Table 3. Comparison of postoperative bleeding volume between the two groups (mean ± SD, mL)

Group	Bleeding volume 2 hours after surgery	Bleeding volume in 24 hours after surgery
Research group (n = 28)	32.49 ± 3.26	199.84 ± 21.25
Conventional group (n = 28)	45.71 ± 5.88	262.45 ± 19.83
t	5.796	4.332
P	< 0.05	< 0.05

3.4. Comparison of complications between the two groups

Patients with postpartum hemorrhage in the research group had fewer complications during hemostatic treatment than those in the conventional group ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of complications between the two groups [n (%)]

Group	Fever	Intrauterine adhesions	Bleeding from the incision	Fluid sonolucent area	Overall incidence
Research group (n = 28)	1 (3.57%)	0	1 (3.57%)	1 (3.57%)	3 (10.71%)
Conventional group (n = 28)	4 (14.29%)	1 (3.57%)	2 (7.14%)	3 (10.71%)	10 (35.71%)
χ^2					9.787
P					< 0.05

4. Discussion

Postpartum hemorrhage poses a severe threat to maternal life safety. Closing the blood sinus promptly and improving hemostasis efficiency are the keys to saving the patient's life [6]. At present, there are many methods to treat patients with postpartum hemorrhages, such as intrauterine packing of saline gauze or uterine balloon, powerful uterotonic and long-acting oxytocin injection, uterine artery ligation, uterine massage, hysterectomy, especially uterine compression suture, is currently the most widely used postpartum hemostasis method [7]. This study was randomized controlled, and the results showed that the hemostatic efficiency of the research group was 92.86%, which was higher than that of the conventional group, 71.43% ($P < 0.05$). It shows that uterine compression suture has a definite hemostatic effect. In a study report by Li and Feng [8], the effects of uterine compression sutures in the observation group and conventional hemostatic treatment in the control group were compared. The results showed that the hemostatic effect of the observation group was 95.83%, which was higher than that of the control group, which was 79.17%. The hemostatic efficiency is highly consistent with this study. Although conventional methods to stop bleeding have a specific effect, they are not compelling enough, and the overall effect is unsatisfactory. For example, during the process of uterine cavity packing with saline gauze, the risk of hidden bleeding may increase because the gauze packing is uneven, dead space is left, or the packing is not tight, leaving saline gauze or uterine cavity balloon in place for a long time can quickly induce infection [9]. Uterine compression suture mainly slows down and delays the local blood flow rate by compressing the uterine wall, thereby promoting the formation of thrombosis at the vascular stump to achieve adequate hemostasis [10]. At the same time, the bleeding volume at 2 hours and 24 hours after surgery in the research group was lower than that in the conventional group. The time to stop bleeding, total hospitalization, promote lochia excretion, and return to normal menstrual cycle were shorter than in the conventional group (P <0.05). It shows that uterine compression sutures can reduce the amount of bleeding and speed up the patient's postoperative recovery. A randomized controlled study conducted by Yang *et al.* reported

the observation group had less intraoperative and postoperative bleeding than the control group [11]. Another randomized controlled study by Chen *et al.* also reported the hemostasis time of uterine compression suture was shorter than that of uterine cavity packing gauze and uterine cavity balloon [12]. Whilst there are currently four most common hemostasis methods for uterine compression suture (B-lynch suture, lower uterine segment compression/constriction suture, Cho suture, and Hayman suture), each has its specific indications, which can meet the treatment needs of different patients and increase clinical benefits [13]. Finally, the total incidence rate of complications such as fever, intrauterine adhesions, incisional bleeding, and fluid dark areas in the research group was 10.71%, which was lower than in the conventional group, 35.71% ($P < 0.05$). A randomized controlled study by Chen found that the overall complication rate after uterine compression suture surgery was 4.00%, which was lower than the 16.00% rate in the control group [14]. Compared with a lower complication rate in this study, this may be related to the sample size. Nonetheless, uterine compression suture is a reliable and safe way to stop bleeding and reduce postoperative complications.

In summary, uterine compression suture has a definite hemostatic effect, can shorten the hemostasis time, reduce the amount of bleeding, reduce complications, and speed up the patient's postoperative recovery, and is worthy of widespread recommendation.

Disclosure statement

The author declares no conflict of interest.

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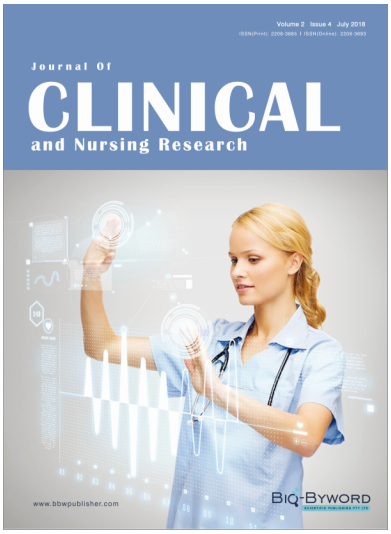
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