Clinical Value of Predictive Nursing Intervention on Deep Venous Thrombosis of Lower Extremities after Cesarean Section

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Abstract [**Objectives**] To explore the clinical nursing value of predictive nursing intervention in patients with deep venous thrombosis of lower extremities after cesarean section. [**Methods**] From December 2022 to April 2023, 105 pregnant and lying-in women who were hospitalized in the Gynecology Department of Pingquan Hospital and underwent cesarean section and met the inclusion criteria were included as the study objects. According to the medical records, they were divided into observation group (n = 52 cases) and control group (n = 53 cases). The clinical experimental subjects were divided into two groups. One group was the control group with routine nursing, and the other group was the observation group with predictive nursing intervention. The number of cases of deep venous thrombosis of lower extremities in the two groups was recorded to evaluate the clinical value. [**Results**] The incidence of deep venous thrombosis of lower extremities in the two groups after cesarean section was compared, and it was suggested that the incidence of the observation group was lower than that of the control group (P < 0.05). [**Conclusions**] Special predictive nursing intervention can greatly reduce the incidence of deep venous thrombosis of lower extremities after cesarean section, improve nursing satisfaction, and improve clinical efficacy, which is worthy of recommendation.

Key words Predictive nursing intervention, Cesarean section, Deep venous thrombosis of lower extremities, Clinical value

1 Introduction

As the cesarean section rate increases year by year, some scholars believe that effective muscle nursing interventions for pregnant women after cesarean section can help reduce muscle spasms, stimulate the rapid flow of blood in the lower limbs, and use hemodynamics to reduce the incidence of deep venous thrombosis in pregnant women[1]. The predictive nursing model is guided by the new medical model, summarizes the characteristics of different diseases and the behavior of patients, and can greatly reduce various harmful factors to a certain extent, thereby improving the satisfaction of parturient care. Nursing parturients after cesarean section in the perioperative period can promote the recovery of patients and further improve their quality of life. It can also help parturients recover their physical strength and reduce the incidence of mental illness, help take care of their babies as soon as possible, and improve life and quality of life[2]. Predictive nursing intervention is a personalized nursing method of predictive model, which can provide patients with more effective care and management. Through predictive nursing, high-risk hidden dangers can be detected in advance. Such early intervention can help reduce the occurrence of complications and improve the postoperative recovery of parturients[3]. For those patients who experience postoperative life quality decline and emotional distress, predictive nursing interventions in advance can help the nursing team to identify them in advance, and at the same time, corresponding interventions can be carried out to improve their life quality and emotional status[4-7]. The aim of this study was to explore the effect of the use of predictive care in patients with perioperative cesarean section. Although there are many studies on predictive nursing in all kinds of parturients, there are few studies on the effect of predictive nursing on deep venous thrombosis of lower extremities after cesarean section.

2 Data and methods

2.1 Data sources and processing Continuously included from December 2022 to April 2023, hospitalized in the Department of Gynecology of Pingquan Hospital, 105 patients underwent cesarean section, and were included in the criteria of the review experiment as research objects. According to the medical records, they were divided into observation group (n = 52 cases) and control group (n = 53 cases).

Inclusion criteria: (i) after cesarean section, (ii) voluntary participation in the study.

Exclusion criteria: (i) various types of diabetes mellitus; (ii) connective tissue disease; (iii) infectious diseases; (iv) hematological diseases.

Informed consent was required and approved by the Medical Ethics Committee of Pingquan Hospital. All patients' medical record number, name, gender, past disease history and other basic information were recorded. The Laboratory Department of Pingquan Hospital uniformly used a fully automatic biochemical analyzer (Beckman AU 5800) to conduct routine biochemical tests on liver and kidney function, blood sugar, blood lipids, *etc.*, and routinely performed supermarket examinations of deep veins of the lower extremities before and after surgery (VIVID E9 ultrasound diagnostic instrument of GE Company in the United States), and the final ratio was uniformly sorted and recorded.

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2.2 Predictive nursing methods

2.2.1 Nursing in the control group and the observation group. The control group was given routine nursing care: limb movement in bed, drinking more water after venting, air pressure treatment of both lower limbs, and detection of D-dimer index of parturient before and after surgery. The observation group was given predictive nursing intervention[8-10].

(i) Developing a care plan. On the basis of comprehensive diagnosis and treatment experience and information materials, the nursing plan was formulated, the analysis of the possible situation and the causes of adverse symptoms were taken as the focus, and the relevant nursing measures were put forward.

(ii) Implementing plan. ① After hospitalization, patients were actively examined to evaluate their physical condition. ② Before operation, the patients were taught the related disease knowledge in multimedia mode, the main points of self-care after operation were explained, and the questionnaires were assessed after the education to evaluate the mastery of the patients. ③ The patient's eating habits after cesarean section were effectively guided, and they fasted within 6 h after the operation, took a small amount of warm boiled water orally after eating, and gradually transitioned to diet after the patient's venting is normal. In the process of giving predictive intervention, nurses need to evaluate the patient's psychological state, including observing speech, behavior, facial expressions, *etc.*, to understand their possible distress or discomfort, and actively communicate with the patient to reduce anxiety, depression and other emotions caused by disease and surgery, and promote the recovery of their physical and mental health through emotional support and comfort[11]. ④ After discharge from the hospital, the patient was instructed to maintain a regular diet, avoid taking too much oil, reduce the intake of spicy food, and keep the stool unobstructed. Regular follow-up of patients can be carried out in the form of telephone or outpatient review, so as to grasp the changes of the patient's condition and recovery[12]. Predictive nursing, which includes the whole process of surgery, is the measure of strengthening case care for patients on the basis of routine basic care. The specific manifestations are as follows.

2.2.2 Preoperative. The data of the two groups of parturients were collected by the hospital medical record system, and the differences in age, gestational age, body mass index, regular physical exercise (4 – 7 months after pregnancy), underlying diseases, such as hypertension, diabetes, hyperlipidemia history, D-dimer (D-D) level and other factors between the two groups of parturients were compared. The pregnant women were informed of the causes and preventive measures of deep vein thrombosis of the lower extremities, targeted psychological counseling for the negative psychology of the pregnant women was given, the attention to pregnant women was emphasized, and the enthusiasm for treatment was improved.

2.2.3 Intraoperative. Attention was distracted and fear was eliminated, so that parturients can undergo surgery happily and confidently.

2.2.4 Postoperative. The exercise intervention was performed, and the parturients were guided to carry out lower limb exercise: ①Within 4 – 6 h after surgery, passive lower limb training was done for the parturients, the lower limbs were raised every 15 min, and lower limb massage was given to promote blood circulation, alternately. ②After 6 h, exercise was done independently following the procedure. The above methods were carried out alternately, and parturients were encouraged to get out of bed early. For example, comatose parturients need to squeeze the gastrocnemius muscle, and at the same time, the lower limbs need to be raised early, with the degree of raising of 20 – 30°, which will help the veins to achieve return. The pressing method is as follows: first, the nurse used one hand to effectively raise the lower limbs of the parturients, and used the other hand to squeeze the gastrocnemius muscle rhythmically. Each pressing lasted for 3 – 5 min, squeezing for 1 sec and relaxing for 1 sec, alternating, once every 2 h. In terms of life care, 4 – 6 h after surgery, patients were helped to turn over every 2 h, keep mattresses clean, and patients were guided to drink plenty of water to promote blood circulation, and maintain adequate sleep.

2.3 Observational index The incidence of lower extremity swelling and the incidence of deep vein thrombosis were evaluated by color Doppler ultrasound. According to the Newcastle Satisfaction with Nursing Scale (NSNS), the two groups of patients were evaluated for nursing job satisfaction. The lowest score of the scale was 19 points (every 18 points for a level, 57 points mean satisfied), and the highest score was 95 points.

2.4 Statistical methods A total of 105 cases of cesarean section parturient data were input to the SPSS 23.0 statistical software for processing, general data were expressed by ($\bar{x} \pm s$), and t test was taken; the occurrence rate of lower limb swelling and lower limb deep vein thrombosis was expressed by [n(%)], and the χ^2 test was adopted. If $P < 0.05$, the difference was statistically significant.

3 Results and analysis

3.1 Baseline characteristics of the two groups The baseline characteristics of the two groups showed that compared with the control group, gestational age, history of hypertension, age, mean arterial pressure, fasting blood sugar, triglycerides, and preoperative D-dimer in the observation group had no statistical significance ($P > 0.05$), but there was a statistical difference in postoperative D-dimer ($P < 0.05$) (Table 1).

3.2 The incidence of deep vein thrombosis in the two groups [n(%)] There were 7 cases of deep vein thrombosis in the control group (18.42%), 1 case of deep vein thrombosis in the observation group (2.63%), and the number was even smaller in the observation group ($P < 0.05$) (Table 2).

Table 1 Comparison of baseline characteristics between the two groups of participants

Items	Observation group	Control group	χ^2/t	P
Gestational age (months)	37.25 ± 2.15	36.84 ± 1.87	7.408 *	0.134
History of hypertension[n (%)]	7.00 (15.56%)	8.00 (17.78%)	0.685 *	0.466
Age (years, $\bar{x} \pm s$)	28.54 ± 1.72	28.44 ± 1.57	0.412	0.761
Mean arterial pressure (mmHg, $\bar{x} \pm s$)	102.30 ± 12.47	103.93 ± 14.71	0.269	0.205
Fasting blood glucose (mmol/L $\bar{x} \pm s$)	4.99 ± 2.48	4.89 ± 1.65	1.315	0.16
Triglyceride (mmol/L, $\bar{x} \pm s$)	1.96 ± 2.12	1.89 ± 1.39	1.036	1.38
Preoperative D-dimer (mmol/L, $\bar{x} \pm s$)	0.34 ± 0.02	0.43 ± 0.03	1.610	1.41
Postoperative D-dimer (mmol/L, $\bar{x} \pm s$)	0.41 ± 0.04	0.61 ± 0.12	0.505	$P < 0.05$

Table 2 Incidence of deep vein thrombosis in two groups

Group	Total number of cases	Incidence of lower limb swelling	Incidence of deep venous thrombosis in lower extremities
Control	52	8 (15.38)	4 (7.69)
Observation	53	2 (3.77)	1 (1.89)
χ^2		1.269	0.618
P		$P < 0.05$	$P < 0.05$

3.3 Comparison of satisfaction with nursing service between two groups The satisfaction of patients in the observation group was significantly higher than that in the control group ($P < 0.05$), as shown in Table 3.

Table 3 Comparison of NSNS scores between the two groups of patients

Group	Number of cases	38 – 56 points	57 – 75 points	76 – 94 points	95 points	Satisfaction//%
Control	52	18	8	12	14	65.3
Observation	53	10	16	10	17	81

4 Discussion

The postoperative blood of patients is in a state of hypercoagulation, which will cause the formation of deep vein thrombosis, posing a great threat to the recovery of patients and affecting the quality of life and treatment effects of patients[13]. In addition, normal maternal patients may have negative emotional reactions such as anxiety, fear, worry, and depression, which are more obvious for postoperative patients. Mental health problems may affect maternal treatment effects and immune function[14]. Predictive intervention care should be carried out according to the treatment plan, disease status and physical condition of the parturients, and the case-based care should be formulated in advance. The study showed that predictive care had an impact on patient recovery. According to the data, the baseline data of the two groups were basically the same (Table 1). The incidence of lower limb venous thrombosis and deep venous thrombosis in the observation group was significantly lower than that in the control group (Table 2). Predictive nursing intervention for parturients after cesarean section can largely prevent the formation of deep vein thrombosis in the lower extremities. There were many nursing interventions for postoperative patients in the past. This study involved evaluation of patients before, during and after surgery, and aimed to improve personalized, holistic and effective nursing services. According to different patients, the provision of more specialized care measures has a positive impact on improving the postoperative quality of life of the parturients.

Previous studies have shown a high incidence of postpartum deep vein thrombosis and a high mortality rate. Statistically, the incidence of lower extremity deep vein thrombosis was estimated at 0.76 to 1.72 per 1 000 pregnancies[15]. The risk was 4 – 5 times higher than that of non-pregnant people. Therefore, predictive nursing intervention was extremely necessary for parturient women after cesarean section. The physical condition of the puerpera was relatively special, with postpartum secretion of a large amount of estrogen, excessive production of coagulation factors, decrease of fibrinolytic activity and antithrombin level, and high blood coagulation; fasting was needed before surgery, and the use of hemostatic agents after surgery can increase the blood viscosity of the body to a certain extent, and the risk of deep vein embolism in the lower limbs increased[16]. Predictive care was important for parturient. Compared with the control group, the incidence of deep vein thrombosis in the lower extremities was lower in the observation group ($P < 0.05$), which indicated that through the screening of high-risk factors before operation, corresponding interventions during and after operation, such as relaxing the parturients' thoughts and emotions during operation, and giving parturients reasonable limb exercise, it can promote recovery after operation.

In recent years, pregnant women with cesarean section combined with underlying diseases, such as diabetes, hypertension and other diseases, may have lower extremity arteriosclerosis[17]. Patients rest in bed for a long time after surgery, which is not conducive to blood circulation, and eventually leads to blood stasis in the vein, causing lower extremity venous thrombosis, thereby affecting the prognosis. Therefore, postoperative bedridden patients need to take measures to prevent lower extremity venous thrombosis in order to ensure postoperative recovery[18]. Although the nursing staff can provide scientific and effective services and guidance in

the routine nursing of bedridden patients after surgery, there are also some defects, such as simple nursing content, and the inability of nursing staff to fully take into account the conditions of patients, which lead to the difficulty of achieving the expected nursing effect. Nursing program is a nursing mode aimed at improving the quality of nursing management. During the implementation process, nursing staff need to conduct systematic analysis and formulate measures according to the expected goals to ensure that the goals can be achieved. According to research reports, the application of nursing program can reduce the incidence of lower extremity venous thrombosis after cesarean section, and greatly improve patient satisfaction. The results showed that compared with the control group, the Newcastle Satisfaction with Nursing Scale (NSNS) nursing satisfaction in the observation group was higher, indicating that carrying out nursing program can significantly improve patients' limb function and cognitive function, and continuously improve patients' satisfaction after surgery. In routine nursing, nursing staff did not carry out health education, and some patients lacked understanding of lower extremity venous thrombosis, resulting in low nursing compliance, and the nursing effect could not be fully exerted. Nursing staff provide case care to patients, which can improve patients' attention to lower limb thrombosis. Under the guidance of nursing staff, functional training can increase the amount of limb activity, improve limb function, avoid lower limb veins causing lower limb venous thrombosis, and ultimately improve nursing satisfaction. Through the research and observation, it was found that the incidence of deep vein thrombosis of the lower extremities in the observation group was lower after cesarean section, which was similar to the results of Kuang Hanyu's study, thus confirming the application of nursing program in the prevention of lower extremity vein thrombosis. This study showed that predictive nursing can improve the self-care ability of parturients, promote better recovery, and reduce the occurrence of complications. Predictive nursing application is to strengthen nursing measures for parturients on the basis of conventional nursing, and improve the degree of recovery of patients through preventive nursing measures at different stages of perioperative period. It has high value in clinical practice and is worth popularizing and using in clinical practice.

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