

Original Article

Clinical nursing care intervention of perioperative infections in the obstetrics and gynaecology department

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Abstract: Objective: To explore the effect of clinical nursing care on perioperative infections in the Obstetrics and Gynaecology Department. Methods: A total of 144 patients undergoing gynecological and obstetric surgery were enrolled as research subjects and their clinical data were retrospectively analyzed. These patients were divided into two groups according to the nursing intervention mode. Patients in the observation group were nursed with the systematic nursing intervention, while patients in control group were nursed with routine nursing intervention. There were 72 patients in each group. The following indexes in two groups were compared: perioperative infection, length of stay, postoperative body temperature, time it took for body temperature to return to normal, SAS and SDS scores, levels of inflammatory factors and nursing satisfaction. Results: The observation group after nursing intervention showed significantly lower perioperative infection rates than that in the control group ($P<0.001$). The patients in the observation group experienced significantly shorter time for their body temperature to return to normal and hospital stay than those in the control group (both $P<0.001$). The postoperative body temperature in the observation group was lower than that in the control group ($P<0.001$). In addition, SAS and SDS scores, and the levels of CRP, IL-6 and IL-8 in the observation group were all significantly lower than those in control group (all $P<0.001$), while the nursing satisfaction of the observation group was remarkably higher than that in the control group ($P=0.027$). Conclusion: The systematic nursing intervention can effectively reduce the rate of perioperative infections, promote the rehabilitation of patients and improve nursing satisfaction in the obstetrics and gynaecology department. Thus it is worthy of popularization and application in clinical practices.

Keywords: Obstetrics and gynaecology department, perioperative period, nursing intervention, efficacy

Introduction

In recent years, gynecological and obstetric diseases are increasingly prevalent and they seriously threaten life quality and physical and mental health of these patients [1, 2]. Surgical procedures are often used for treatment of gynecological and obstetric diseases, and surgery plays an important role in improving life quality of patients. Due to operation trauma, low immunity and other factors, the incidence rate of perioperative infection in these patients is relatively high [3, 4]. In clinical practice, perioperative infection has become the main issue for affecting outcomes of gynecological and obstetric diseases. It is reported that anxiety and depression, poor treatment compliance, and loss of confidence for continual therapy and other problems in patients occur during the

perioperative period and these are not conducive to the patients' recovery [5]. Therefore, it is necessary to take targeted nursing measures for such patients to improve the perioperative infection rates.

So far, the effect of routine nursing used for patients with gynecological and obstetric diseases during the perioperative period in clinical practices is not satisfactory [6]. There is a one-sidedness in routine nursing which can be described as: insufficient attention to the impact of environmental intervention, as well as psychological changes of patients and the overall care of patients etc. [7]. It has been reported that problems such as insufficient operative knowledge of gynecological and obstetric diseases, insufficient health guidance and insufficient nutrition balance of patients

also exist with routine nursing [8]. In this context, we adopted systematic nursing intervention for patients with gynecological and obstetric diseases during the perioperative period. In contrast to routine nursing, systematic nursing intervention is mainly based on high-quality and comprehensive nursing services for patients [9]. Some studies reported that systematic nursing intervention could provide high-quality nursing in the management of tumor patients [10]. However, there are little reports on the efficacy of systematic nursing intervention on perioperative infection in the Obstetrics and Gynaecological Departments. Therefore, in this study, the effects of systematic nursing intervention on perioperative infection were observed, and the impacts of the interventions on negative emotions, the levels of inflammatory factors and nursing care satisfaction in patients were investigated. The study can provide an experimental foundation for development of clinical nursing measures in patients with gynecological and obstetric disease during the perioperative period.

Materials and methods

Subjects

A total of 144 Patients with gynecological and obstetric surgery admitted to The Third Affiliated Hospital, SUN YAT-SEN University from June 2018 to December 2019 were enrolled as research subjects, and the clinical data of patients were analyzed, retrospectively. All included patients and their families in this research signed informed consent forms and the study was approved by the Ethics Committee of The Third Affiliated Hospital, SUN YAT-SEN University.

The inclusion criteria were as follows: Patients met the diagnostic criteria of gynecological and obstetric diseases and had surgical indications based on clinical symptoms, physical signs, and imageological examination [11]; Patients underwent continuous epidural anesthesia; Patients were free from infection such as pulmonary infection, urinary system infection and oral fungal infection; Patients received gynecological and obstetric surgery for the first time; Caesarean section is necessary for patients with full-term pregnancy; Patients with detailed clinical data, and their family members signed

informed consent forms and were willing to cooperate with the study.

The exclusion criteria were as follows: Patients with history of gynecological and obstetric surgery, other malignant tumors, mental disorder, severe hepatic and renal insufficiency, cardio- and cerebrovascular disease, and incomplete medical records.

According to the inclusion and exclusion criteria, patients were selected as research subjects. The clinical data were collected. The included patients were divided into a control group nursed under routine nursing intervention (n=72) and an observation group nursed under systematic nursing intervention (n=72).

Methods

Patients in the control group received routine nursing as follows: patients were required to fast preoperatively for 12 h with water deprivation for 8 h. The vital signs of the patients were recorded on day 1 preoperatively. Drug allergy examination and skin preparation were given for patients before surgery. Puerperae were asked to lie in a semireclining position after surgery. Patients were allowed to drink at 6 h after surgery and ambulate one day after surgery. Disinfection of the vulva and anus was performed twice per day. Anti-infective therapy was conducted in patients according the doctor's advice.

Patients in observation group received systematic nursing interventions in addition to routine nursing [12, 13]. Systematic nursing interventions were as follows: (1) Dietary nursing: Patients were provided with a diet that was of a high-quality protein, high calories and rich in vitamins. Any hot or spicy stimulating food was avoided. A nutritionally balanced diet was given to enhance patients' resistance and immunity. (2) Psychological nursing: The changes of psychological activities of the patients in the perioperative period were understood. Patients were provided with psychological counseling to alleviate psychological discomfort, tension and anxiety. Nurses helped patients establish a belief in overcoming the disease, and improved their activity in perioperative treatment and nursing. (3) Environmental intervention: During the perioperative period, a healthy, quiet, com-

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comfortable and warm ward environment was established. Attention was paid to the physical and mental state of the patients. In order to reduce bacterial growth and infections, the times of visiting should be decreased and Air circulation in the wards was conducted. Music was used to shift patients' attention. (4) Health guidance: Patients were informed of relevant knowledge of gynecological and obstetric diseases and operative treatment schemes. Successful cases of surgery were introduced to patients. Moreover, before surgery the complete examinations of patients were performed, and any abnormal indexes were corrected in time. After surgery, patients were encouraged to conduct physical activity practices according to individual patients' conditions. (5) Nursing against infection: the nursing staff was instructed to strengthen respiratory tract nursing, and keep the patients' respiratory tract unobstructed. The nursing staff also helped patients with pulmonary function and to exercise effective coughing. The nursing attention of surgical sites was strengthened and the nursing staff ensured the surgical sites clean and dry. The clinical care of private parts of patients should be strengthened. The application of antibiotics followed the principle of appropriate amount and proper duration. Infection monitoring of patients was conducted to prevent spreading germs by washing hands frequently.

Outcome measures

Perioperative infection: The rate of perioperative infection was compared between two groups. The perioperative infection included incisional wound infection, respiratory system infection, and urinary system infection. The total perioperative infection rate was calculated according to the following formula: Total perioperative infection rate = Numbers of patients with infection/Total numbers of patients] × 100%.

Postoperative body temperature and length of stay: After intervention, the indexes of length of stay, postoperative body temperature and time it too the body temperature to return to normal were recorded and compared between control group and observation group.

SAS and SDS scores: The Self-Rating Anxiety Scale (SAS) and the Self-Rating Depression

Scale (SDS) were used to evaluate the emotional conditions of patients in the two groups before and after intervention [14]. The SAS and SDS scores include 20 items, respectively. Each item was assessed by a 4-level scoring method. For SAS scale, the cut-off value is 50 scores. A score of less than 50 indicated no anxiety and equal to or greater than 50 points indicated anxiety. For SDS scale, the cut-off value is a score of 53 points. Less than 53 points indicated no depression and equal to or greater than 53 points indicated depression. Higher scores suggest greater anxiety or depression.

Inflammation factors: The expression levels of serum inflammatory cytokines were compared between two groups. Three mL of venous blood was drawn from each patient in both groups before and after intervention. The above samples were centrifuged at 3000 r/min for 15 min. and then the supernatant was separated and stored at -20°C. The levels of C-reactive protein (CRP), Interleukin-6 (IL-6) and Interleukin-8 (IL-8) in each group were measured by ELISA methods and compared. The CRP, IL-6 and IL-8 ELISA assay kits were obtained from Sigma Company, USA. The detection was performed strictly following the operating instructions of these kits.

Nursing satisfaction: Patient satisfaction with nursing care was compared after intervention between groups. Patient satisfaction with nursing care refers to patients' subjective assessment of health education, the environment of the wards, working attitudes and skills of nurses as well as outcomes of nursing care. There is a total score of 100 points. More than 90 points is considered as extreme satisfaction. The scores ranging from 70 to 90 were considered as satisfaction. Less than 70 points were considered as dissatisfaction [15]. Patient satisfaction with nursing care was calculated according to the following formula: Nursing care satisfaction = [(Numbers of patients with extreme satisfaction + Numbers of patients with satisfaction)/Total numbers of patients] × 100%.

Statistical analysis

Experimental data were analyzed using SPSS software (IBM, USA), version 22.0. Measure-

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Table 1. Comparison of basic information

Index	Control group (n=72)	Observation group (n=72)	χ^2/t	P
Age (years)	41.25 ± 4.7	40.86 ± 4.3		
BMI (kg/m ²)	21.17 ± 1.04	21.02 ± 0.96		
Hypertension (case)	10	8	0.254	0.614
ABL (g/L)	34.53 ± 2.72	35.12 ± 3.19		
Diabetes (case)	11	14	0.436	0.509
Types of surgery (case)				
Radical operation of ovarian cancer	4	6	1.137	0.888
Cesarean Section	41	39		
Total hysterectomy	14	17		
Hysteromyomectomy	8	6		
Vaginal hysterectomy	5	4		

Note: BMI: body mass index; ABL: Albumin.

Table 2. Comparison of infective rate between control group and observation group [n (%)]

Groups	Incisional wound	Respiratory system	Urinary system	Total infection rate
Control group	9 (12.50%)	7 (9.72)	10 (13.89%)	26 (36.11)
Observation group	2 (2.78)	1 (1.39)	3 (4.17%)	6 (8.33)
χ^2	4.823	4.765	4.143	16.070
P	0.028	0.029	0.042	<0.001

tem infection, and 3 patients with urinary system infection in the observation group. The total infection rate in the observation group was obviously lower than that in the control group with significant differences (36.11% vs 8.33%, $P < 0.001$).

ment data were presented as mean ± standard deviation (SD). Comparisons between two groups were made by the method of T test. Count data were described as case/percentage (n (%)). Comparisons between two groups were performed using chi square tests. $P < 0.05$ was considered statistically significant.

Results

Comparison of basic information

As seen in **Table 1**, there was no significant difference between the two groups regarding age, body mass index (BMI), underlying disease, and types of surgery (all $P > 0.05$), so the two groups were comparable.

Comparison of perioperative infection between two groups

As shown in **Table 2**, there were 9 cases with incisional wound infection, 7 cases with respiratory system infection, and 10 cases with urinary system infection in the control group; while there were 2 patients with incisional wound infection, 1 patient with respiratory sys-

Comparison of postoperative body temperature and length of stay between two groups

As seen in **Table 3**, the length of stay, the postoperative body temperature, the time it too for body temperature to return to normal in the observation group were remarkably lower than those in the control group with significant differences (all $P < 0.001$).

Comparison of SAS and SDS scores between two groups

There were no remarkably statistical differences in the SAS scores (54.16 ± 5.72 vs 54.38 ± 6.05) and SDS scores (53.17 ± 5.64 vs 52.91 ± 5.48) between two groups before intervention (all $P > 0.05$). The SAS or SDS scores after intervention in both groups were obviously lower than those before intervention, and there were significantly statistical differences (all $P < 0.001$). The SAS score (46.41 ± 4.68 vs 40.55 ± 4.32) and SDS score (47.36 ± 4.52 vs 40.12 ± 4.09) in the observation group after intervention were significantly lower than those in the control group with statistically significant differences ($P < 0.001$), as shown in **Figure 1**.

Table 3. Comparison of the postoperative body temperature, the time it took for body temperature to return to normal and length of stay between two groups

Groups	Length of stay (d)	Postoperative body temperature (°C)	Time it took body temperature To return to normal (h)
Control group	6.97 ± 1.52	37.39 ± 0.38	60.04 ± 6.12
Observation group	4.58 ± 1.13	37.10 ± 0.27	51.13 ± 5.08
t/χ ²	10.710	5.279	9.506
P	<0.001	<0.001	<0.001

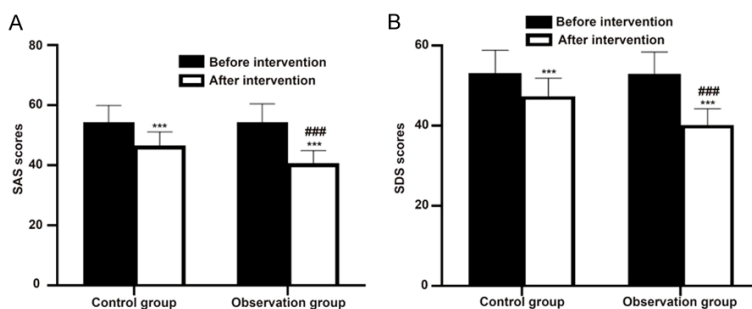


Figure 1. Comparison of SAS and SDS scores between control group and observation group. A. SAS scores; B. SDS scores. Compared with the same group before intervention, ***P<0.001; Compared with the same group after intervention, ###P<0.001. Note: SAS: Self-rating anxiety scale; SDS: Self-rating depression scale.

Comparison of inflammation factors between two groups

The levels of CRP, IL-6 and IL-8 differed insignificantly between two groups before intervention; the corresponding levels in both groups after intervention were significantly lower than those before intervention. The levels of CRP, IL-6 and IL-8 in the observation group after intervention were significantly lower than those in the control group, and the difference was statistically significant (all P<0.001), as shown in **Figure 2**.

Comparison of nursing satisfaction

The nursing satisfaction in the observation group was obviously higher than that in the control group (70.83% (51/72) vs 86.11% (62/72), χ²=4.974, P=0.027). See **Table 4**.

Discussion

Infections in gynecology and obstetrics usually exist in the whole perioperative period, as result of multiple factors. This severely affects the prognosis of patients and exerts a heavy burden to them and their families. With the

changes in concepts of clinical care and the increasing renewal in the nursing intervention modes, the clinical nursing intervention has played an important role in the process of improving the outcomes of patients [16]. In recent years, many studies reported that high quality of clinical nursing intervention is more and more valuable for improving the outcomes of patients [17]. It was reported that systematic nursing intervention is characterized by an

all-around high-quality nursing intervention and the clinical application of this intervention mode had been given increasing attention [18]. In addition, systematic nursing intervention can obviously reduce negative emotions induced by primary diseases, relieve the symptoms of patients, as well as improve the compliance of patients and the occurrence of complications, ultimately enabling patients to obtain satisfactory treatment effects [19]. The systematic nursing intervention used in this research was a new mode of nursing intervention, under which measures including dietary nursing, psychological nursing, environmental intervention, health guidance, nursing against infection were all adopted for patients with gynecological and obstetric diseases during the perioperative period. The results of this study showed that the incidence rate of perioperative infection in the observation group was remarkably lower than those in the control group, indicating that systematic nursing interventions provided a high-quality and integrated nursing for patients, and finally helped them achieve the aim of improving the outcomes of perioperative infection. Moreover, in contrast to those in the control group, the length of stay, the postoperative

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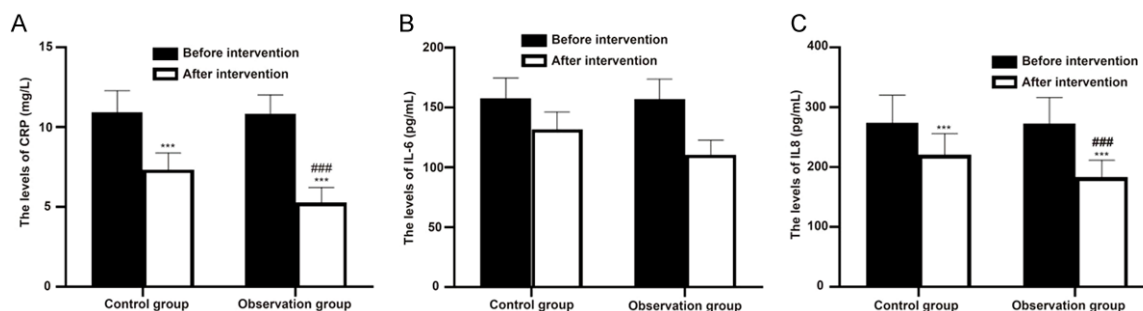


Figure 2. Comparison of inflammation factors between control group and observation group. A. The levels of CRP; B. The levels of IL-6; C. The levels of IL-8. Compared with the same group before intervention, *** $P < 0.001$; Compared with the same group after intervention, ### $P < 0.001$. Note: CRP: C-reactive protein; IL-6: Interleukin-6; IL-8: Interleukin-8.

Table 4. Comparison of nursing satisfaction of patients [n (%)]

Group	Dissatisfaction	Satisfaction	Extreme satisfaction	Satisfaction rate
Control group	21	33	18	51 (70.83%)
Observation group	10	40	22	62 (86.11%)
χ^2				4.974
P				0.027

body temperature, the time it took for the body temperature to return to normal in the observation group were significantly lower, which further indicated that systematic nursing interventions can relieve the symptoms of patients with perioperative infection and accelerate their recovery. The above results were basically accordance with the results reported by Wang et al. [20].

Anxiety and depression presenting during the perioperative have a severe effect on the prognosis of patients with gynecological and obstetric diseases. SAS and SDS scores have been considered as the authoritative tools for quantitative evaluation of psychological status in patients. The results of this study showed that SAS and SDS scores in observation group were remarkably reduced after nursing interventions, indicating that the negative emotions of patients during perioperative period had been significantly improved, which is generally similar to the findings reported by Gould et al. [21]. As we can see, systematic nursing interventions plays a key role in improving the emotional conditions of patients in the gynecological and obstetric department, and enables them to achieve their best physical and psychological status.

In this study, CRP, IL-6 and IL-8 were used as the indexes evaluating the inflammation responses in patients during the perioperative period [22]. As cytokines, CRP, IL-6 and IL-8 play key roles in the body during the whole process of inflammation.

The findings of the current study demonstrate that the implementation of systematic nursing interventions result in the reduced levels of CRP, IL-6 and IL-8 expression, suggesting that there is a quicker recovery of serum-related cytokines to normal in such patients, and ultimate improvements in the inflammation reaction and treatment effects in patients during the perioperative period. In terms of patient satisfaction with nursing, systematic nursing interventions allow them to have a more accurate understanding of nursing work for the perioperative period in the gynecological and obstetric department, improved professional abilities of nurses, and receive more meticulous nursing [23]. Some studies reported that good nursing could improve patients' satisfaction [24, 25]. This study also demonstrated that patients' satisfaction rate in the observation group after systematic nursing interventions was remarkably greater compared with that in the control group, which is basically in accordance with the findings reported by previous studies [26].

In conclusion, systematic nursing interventions could effectively reduce perioperative infections, shorten their hospitalization time, improve the negative emotions and clinical nurs-

ing satisfaction, and decrease the levels of inflammation factors, so it conforms to the nursing needs of the patients in the Gynecological and obstetric department during the perioperative period. However, this study has certain limitations, such as being a single-center study, with a small sample size, and no classification comparison and lack of long-term follow-up results. In the future, it is necessary to conduct a multi-center randomized controlled study with a long-term follow-up and larger sample size for further confirmation.

Disclosure of conflict of interest

None.

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