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Original Article

Effects of high quality nursing on the immunological and psychological states of perioperative patients with endometriosis undergoing laparoscopic surgery

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Abstract: Objective: To explore the influence of high quality nursing on the immunity and psychological state of patients with endometriosis undergoing laparoscopic surgery. Methods: 104 patients with endometriosis who were treated by laparoscopic surgery were prospectively analyzed. Fifty-two patients were randomly divided into the test group who received high quality nursing during the perioperative period, and 52 patients were randomly included in the control group who received conventional nursing during the perioperative period. The curative effects of surgery and incidence of adverse reactions during hospitalization were compared. The Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to assess patients' psychological negative emotions regarding nursing in the two groups. Patients' postoperative medication compliances, levels of antibody IgM, IgA and IgG in serum after nursing, and nursing satisfaction were compared. Results: The test group exhibited better curative effects and lower incidence of adverse reactions than the control group ($P<0.05$). Postoperative medication compliance, immunity, negative emotion and nursing satisfaction of the test group were significantly better than that of the control group ($P<0.05$). Conclusion: High quality nursing for patients with endometriosis during the perioperative period of laparoscopic surgery can effectively improve operation results, reduce adverse reactions, relieve psychological negative emotions, and improve the immunity and nursing satisfactions for patients.

Keywords: Endometriosis, high quality nursing, immunities, psychological states

Introduction

Endometriosis is a common disease in women of childbearing age, and its incidence has been constantly increasing in recent years [1]. At present, endometriosis is mainly treated by surgery, but due to the postoperative adverse reactions and high risk of recurrence, patient's health can be seriously threatened [2]. While previous research focused on the concept of endometriosis as an autoimmune disease, recent studies have explore that the disease may involve alterations in the function of certain immune cells [3]. There was a study [4] which showed that the occurrence and development of endometriosis are closely related to the patient's immune function. Immunoglobulin is a protein with active antibodies produced by immune lymphocytes, which plays the role of anti-inflammation during its involvement in immunization [5]. Moreover, there was another study which found that related indicators, such as IL-8 and TNF-α, in immune function will show certain abnormalities in patients with endometriosis [6].

Treatment of endometriosis by laparoscopy is relatively safe, but with all surgical procedures, there are risks involved, including internal bleeding, hernia at the incision site, infection and damage to blood vessels or other organs, such as the stomach, bowels, or bladder [7]. Patients often feel pain and probably have to stay in the hospital for several days after a laparotomy, and they may need several weeks to recover. Thus their quality of life could be improved through nursing care [8].

High-quality nursing focuses on improving patients' satisfaction by providing comprehensive

nursing, catering to various needs of patients. In recent years, it has been applied to many diseases and achieved good results [9]. In some studies exploring the application value of high quality nursing in gynecological laparoscopic surgery, it was found that the high quality nursing can effectively improve patients' negative emotions and shorten their recovery process [10]. In other studies exploring the influence of high quality nursing invention on the stress response, negative emotion and prognosis of patients in operating rooms, it was found that the application of high quality nursing in the operating room can reduce the pressures on the surgical patients, relieve their negative emotions, and reduce the incidence of postoperative adverse reactions [11]. All the studies above have shown that high quality nursing has achieved good results in previous clinical practices. Some studies have reported that patients with endometriosis are more prone to depression, anxiety and other negative emotions during the perioperative period, and complications and other conditions have an important impact on the life quality of patients [12, 13]. In gynopathy, perioperative nursing also plays an important role in the prognosis of patients. However, there are few reports about the applications of high quality nursing in the perioperative period of patients with endometriosis as well as its effects on immune function.

Therefore, we explored the application effect of high quality nursing in the perioperative period of patients with endometriosis and its impact on patients' immunity and psychological state, to provide a nursing program of better quality for patients with endometriosis and promote their rehabilitation.

Materials and methods

General information

104 patients with endometriosis who were admitted to our hospital and treated by laparoscopic surgery were prospectively analyzed. The average age of patients was (41.23± 11.64) years old. Among them, 52 patients were randomly included in the test group who received the high quality nursing during the perioperative period, and 52 patients were randomly included in the control group who received conventional nursing during the perioperative period, and there were no significant differences in patients' genders, BMIs and literacy level between the two groups (P>0.05) (**Table 1**).

Inclusion criteria: Patients who are diagnosed with endometriosis and scheduled for surgery.

Exclusion criteria: patients with other severe viscera diseases or in combination with tumors; patients with surgical contraindications; patients with emotional disorders or mental illnesses; patients with cognitive disorders or communication disorders; patients who have used SSRIs drugs within 2 weeks prior to study; patients whose educational levels are below primary school level; patients who did not cooperate with the experiment.

All patients and their family members agreed to the experiment and signed an informed consent form. This experiment has been approved by the hospital ethics committee.

Intervention

Both groups of patients were treated with laparoscopic surgery. Nursing began after admission and ended at discharge. The control group received the conventional gynecological nursing during the perioperative period, including the preoperative conventional nursing guidance, postoperative vital signs monitoring, instruction in drug use, and dressing change, while the test group received high-quality nursing, and the specific measures are as follows:

(1) Preoperative nursing: patients are prone to negative emotions such as fear and anxiety due to the fear of surgery and lack of understanding of the disease [14], so the nursing staff should promptly and patiently adjust the patient's psychological state, help the patient regulate their negative emotions, and explain the surgery process and disease-related knowledge to the patient carefully and patiently, including treatment plans, surgical methods, precautions for taking drugs, and what may happen to any postoperative wounds. They should tell the patient about the need for surgery and related examinations, reduce the fear of the patient due to the incomprehension of the surgery, assist the patient to conduct a comprehensive preoperative examination, discuss presurgery fasting and how to use an enema at

Table 1. General information

Factor	Test group n=52	Control group n=52	X^2/t	P
Age			0.040	0.841
≥40	31 (59.62)	32 (61.54)		
<40	21 (40.38)	20 (38.46)		
BMI (kg/m^2)			0.040	0.842
≥22	22 (42.31)	21 (40.38)		
<22	30 (57.69)	31 (59.62)		
Married			0.038	0.845
Yes	25 (48.08)	26 (50.00)		
No	27 (51.90)	26 (50.00)		
Gave birth			0.04	0.483
Yes	23 (44.23)	22 (42.31)		
No	29 (55.77)	30 (57.69)		
Coagulation function				
APTT s	29.05±2.43	28.96±2.54	0.185	0.854
PT s	11.73±1.12	11.87±1.07	0.652	0.516
FIB g/l	3.16±0.21	3.15±0.23	0.232	0.817
TT s	14.63±1.62	14.58±1.59	0.159	0.874
Dysmenorrhea			0.474	0.7491
Yes	41 (7.85)	38 (73.08)		
No	11 (21.15)	14 (26.92)		
Education level			0.480	0.827
Secondary school and below	15 (28.85)	14 (26.92)		
Above middle school	37 (71.15)	38 (73.08)		
Immune function index (g/L)				
IgM	1.25±0.11	1.24±0.12	0.443	0.659
IgA	1.95±0.32	1.93±0.34	0.309	0.758
IgG	2.16±0.18	2.13±0.15	0.923	0.358
Negative emotion				
SAS	51.07±4.23	51.38±4.37	0.378	0.714
SDS	52.12±4.31	51.96±4.48	0.186	0.853

the night before the operation, and help the patient learn how to relax the muscles of various parts of the body, help the patient maintain a light heart to receive the surgery and improve their compliance to surgeries.

(2) Intraoperative nursing: the nursing staff should assist in monitoring the vital signs of the patient during the surgery, and cooperate with the doctor's surgical advice in during the operation in a serious and responsible manner. Once the patient has abnormalities, they should communicate with the doctor and solve it effectively within 5 minutes.

(3) Postoperative nursing: after the operation, the patient's vital signs should still be closely monitored. If any abnormality is found, it should be reported to the responsible doctor and solved as soon as possible. Anti-infection drugs and gestrinone are continuously used after surgery. After the passage of gas, the patient's diet should be gradually restored, and the patient should be guided to have a light diet with high-protein and high-calories. The sanitation and basic settings of the ward should be checked. Patient's urethra and vulva should be cleaned and disinfected daily, and the drainage bag should be changed daily to prevent retrograde infection. The patient should be encouraged to move more after he/she can go to ground activity. At the same time, attention should be paid to the patient's psychological states. Once the patient has any negative emotions such as depression and anxiety, the patient should be promptly encouraged and comforted. The ward should be kept ventilated and comfortable. When the patient is discharged from the hospital, the nursing staff should advise the patient carefully in any precautions and help the patient develop ideas for resuming activity. The intervention was started after the patient is admitted to the hospital; intervention ended when the patient is discharged.

Outcome measures

The curative effects of the operation between the two groups after surgery are evaluated [15]: curative effects are divided into excellent, effective and ineffective. The total effective rate = (number of the "excellent" + number of the "effective")/the total number of patients × 100%. The incidence of adverse reactions dur-

Table 2. The operative effect of the two groups of patients [n (%)]

Effective rate of treatment	Test group n=52	Control group n=52	X^2	P
Obvious effect	40 (46.92)	25 (48.08)	9.231	<0.050
Effective	10 (19.23)	8 (15.38)	0.269	0.604
Invalid	2 (3.85)	19 (36.54)	17.21	<0.050
Total effective rate	50 (96.15)	33 (63.46)	9.231	<0.050

Table 3. Complications of the two groups of patients [n (%)]

Complication	Test group n=52	Control group n=52	X^2	P
Dizzy	2 (3.85)	4 (7.69)	0.756	0.401
Subcutaneous congestion	1 (1.92)	5 (9.62)	2.830	0.093
Subcutaneous emphysema	0	2 (3.85)	2.039	0.153
Complication rate	3 (5.77)	11 (21, 15)	5.283	<0.050

ing hospitalization was recorded and compared between the two groups, the adverse reactions include dizziness, subcutaneous congestion and subcutaneous emphysema.

The psychological negative emotions after 2 weeks of nursing of the two groups were evaluated by the Self-Rating Anxiety Scale (SAS) and the Self-Rating Depression Scale (SDS) [16], of which scoring at 50-59 was regarded as mild anxiety or depression; scoring 60-69 was classified as moderate anxiety or depression, and scoring over 70 was regarded as severe anxiety or depression

The postoperative medication compliance of gestrinone after surgery between the two groups are compared, and the medication compliances are classified as full compliance, general compliance, and non-compliance, total compliance = full compliance rate + general compliance rate.

The levels of immune function index IgM, IgA and IgG antibodies for the two groups are compared after 2 weeks of nursing.

The nursing satisfactions of the two groups are evaluated and compared by answers in a questionnaire survey when patients were discharged, and the nursing satisfaction score are classified as very satisfied, satisfied and dissatisfied, the total nursing satisfaction rate = (satisfied patients + very satisfied patients)/total patients × 100%.

Statistical methods

SPSS 19.0 statistical software (Beijing NDTimes Technology Co., Ltd.) was used for the statistical analysis of data. The measurement data were expressed in mean ± standard deviation, the independent t test was used for the comparison between two groups. Paired t-test was used for comparison at different time points within group, and the chi-square test was used for the count data, and P<0.05 indicated the difference was statistically significant.

Results

Comparison of operation curative effects between the two groups

The number of patients in the test group whose operation curative effects were excellent, effective and ineffective were 40, 10 and 2 respectively, and the total effective rate was 96.15%. While the number of patients in the control group whose operation curative effects were excellent, effective and ineffective were 25, 8 and 19 respectively, and the total effective rate was 63.46%. The effective rate of the test group was significantly higher than that of the control group, and the difference was statistically significant (P<0.05) (**Table 2**). The results indicated that high-quality nursing can effectively improve the curative effects of patients' operation.

Adverse reactions in the two groups

There were only 2 patients with dizziness, and 1 patient with subcutaneous congestion in the test group, and the total rate of adverse reactions was 5.77%. While the numbers of patients who had dizziness, subcutaneous congestion and subcutaneous emphysema were 4, 5 and 2 respectively, the total rate of adverse reactions was 21.15%. The postoperative adverse reactions of the test group were significantly lower than that of the control group, and the difference was statistically significant (P<0.05) (**Table 3**).

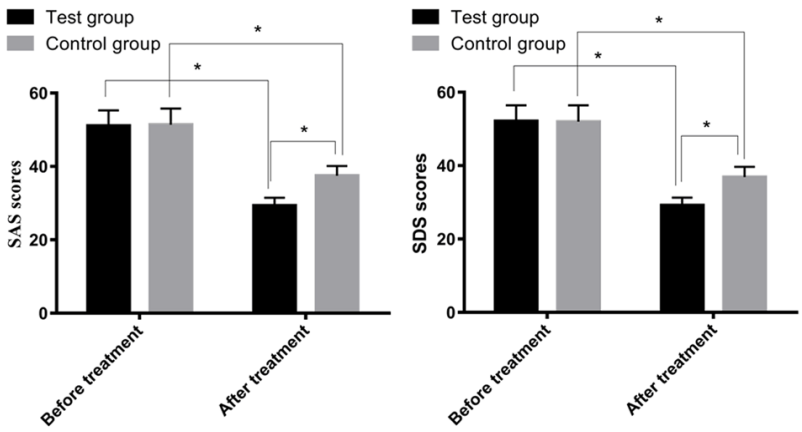

Figure 1. The SAS and SDS scores of the two groups after care. The SAS and SDS scores of the test group were significantly lower than those of the control group after intervention (P<0.05). Note: *indicates P<0.05.

Table 4. Medication adherence of the two groups of patients [n (%)]

	Test group n=52	Control group n=52	X^2	P
Complete compliance	40 (76.92)	21 (40.38)	14.31	<0.05
General compliance	11 (21.15)	13 (25.00)	0.217	0.612
Noncompliance	1 (1.92)	18 (34.62)	18.61	<0.050
Compliance rate	51 (98.08)	34 (65.38)	18.61	=0.004

Table 5. Comparison of serum IgM, IgA and IgG antibody levels in the two groups of patients (g/L)

Index	Test group n=52	Control group n=52	t	p
IgM	2.18±0.23	1.35±0.19	20.06	<0.001
IgA	2.11±0.46	2.14±0.51	0.315	0.753
IgG	1.86±0.25	2.45±0.23	1252	<0.001

Negative emotion scores after nursing in the two groups

The SAS score and SDS scores of the test group were (29.33±2.15) and (29.17±2.09) respectively. The SAS score and SDS score of the control group were (37.46±2.67) and (36.85±2.83) respectively. The SAS score and SDS score of the test group were significantly higher than those of the control group, the difference was statistically significant (P<0.05) (**Figure 1**).

Comparison of postoperative medication compliance between the two groups

After the operation, the numbers of patients who have full compliance, general compliance, and non-compliance to medication in the test group were 40, 11 and 1 respectively, and the total comliance rate was 98.08%; and the numbers of patients who have full compliance, general compliance, and non-compliance to medication in the control group were 21, 13 and 12 respectively, and the total compliance rate was 73.91%. The postoperative medication compliance rate of the test group was significantly higher than that of the control group, and the difference was statistically significant (P<0.05) (**Table 4**).

Comparison of postoperative immune function indexes between the two groups

The serum IgM level of the test group after nursing was (2.18±0.23) g/L, which was significantly higher than that of the control group, (1.35±0.19) g/L, the difference was statistically significant (P<0.05). The serum IgG level of the test group after nursing was (1.86±0.25) g/L, which was significantly lower than that of the control group, (2.45±0.23) g/L, this difference was statistically significant (P<0.05). There was no significant difference in serum IgA levels between the two groups (P>0.05) (**Table 5** and **Figure 2**).

Comparison of nursing satisfaction between the two groups

The numbers of patients who were very satisfied, satisfied and dissatisfied with the nursing in the test group were 41, 10 and 1 respectively, and the nursing satisfaction was 98.25%; while the numbers of patients who were very satisfied, satisfied and dissatisfied with the nursing in the control group were 22, 15 and 15 respectively, and the nursing satisfaction was 71.15%. The nursing satisfaction of the test group was significantly higher than that of the control group. The difference was statistically significant (P<0.05) (**Table 6**).

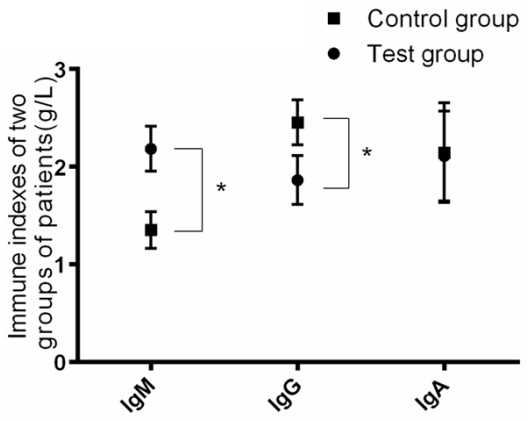

Figure 2. The comparison of the content levels of serum IgM, IgA and IgG in the two groups after nursing. The serum IgM level of the test group after nursing was significantly higher than that of the control group, and the difference was statistically significant ($P<0.05$). The serum IgG level of the test group after nursing was significantly lower than that of the control group, and the difference was statistically significant ($P<0.05$). However, there was no significant difference between the serum IgA levels ($P>0.05$). Note: *indicates $P<0.05$.

Discussion

Endometriosis is a benign lesion of gynopathy, but due to its high possibility of metastasis and recurrence, corresponding treatment should be taken in due time after onset [17]. At present, surgery is still the main treatment for patients with endometriosis, but a series of problems caused by surgery make the patient's perioperative nursing particularly important [18]. High quality nursing is a kind of refinement and standardization for conventional nursing and it is combined with psychological nursing during the whole process [19]. Some studies have shown that adopting a high quality of nursing in patients' perioperative period can effectively alleviate patients' negative emotions and improve their nursing satisfactions [20, 21].

Therefore, we explored the application of perioperative high quality nursing in patients with endometriosis. By developing a series of high-quality nursing programs and carrying them out in the test group, we found that the total effective rate of surgery in the test group was higher than that of the control group, and the adverse reactions were lower than that of the control group, with the difference being statistically significant. This result fully demonstrates that the application of high quality nursing in patients with endometriosis can effectively improve the patient's recovery and negate adverse reactions. There was a study that explored the impact of high quality service on the patients' success rate of emergency surgery, it was found that the success rate of emergency surgery for patients who received the high quality service was higher than that for patients who received conventional nursing. Although this study did not directly show the impact of high quality nursing on the surgery effect, it was consistent with our conclusion from the view of the success rate of surgery. Then we compared the postoperative negative emotional scores, postoperative medication compliance and nursing satisfactions of the two groups, the result showed that all indexes mentioned for the test group were better than those in the control group, which indicated that the high quality of nursing can effectively improve the patient's negative emotions, medication compliances and nursing satisfaction. There was a study [22] that explored the medication compliance and nursing satisfaction of patients with depression who received high quality nursing, it was found that the medication compliance and nursing satisfaction of patients who received high quality nursing were significantly higher than those of the control group [23]. Although this study was aimed at patients with depression, the study's result can also show that high quality nursing can improve the conditions of patients with depression, which was consistent with our study conclusion in the respect of the improving patients' negative emotions, and the other research results in this study are also consistent with ours.

In recent years, studies have shown that the occurrence and development of endometriosis are closely related to the immune function of patients [24], with IgA, IgG and IgM being important immunoglobulins involved in immune function [25].

Therefore, while comparing the results above, we also compared the immune function indexes after nursing between the two groups, the result showed that the serum IgM level of the test group after nursing was significantly higher than that of the control group, the serum IgG level of the test group after nursing was significantly lower than that of the control group, and

Table 6. Comparison of nursing satisfaction between the two groups of patients [n (%)]

Nursing satisfaction	Test group n=52	Control group n=52	X^2	P
Very satisfied	42 (80.77)	22 (42.31)	16.25	<0.050
Satisfied	9 (17.31)	15 (28.85)	1.950	0.163
Dissatisfied	1 (1.92)	15 (28.85)	14.48	<0.050
Nursing satisfaction	51 (98.08)	37 (71.15)	14.48	=0.001

differences were statistically significant, while there was no significant difference in serum IgA levels between the two groups.

Some studies have shown that IgG, as the main constituent protein of human serum immunoglobulin, also plays a major role in the anti-infection process [26], so after nursing, the expression of IgG is changed with the infection rate of the patients also being reduced, which indicated that the application of high quality nursing can improve the patient's immunity and alleviate the patient's infection. Both IgA and IgM are immunoglobulins that play roles in the early defense of the body [27], so their changes should not be obvious in theory; however, there is no significant difference in the expression levels of IgA between the two groups after nursing in this study, while the expression level of serum IgM in the test group was significantly higher than that in the control group, which needs to be further explored in the follow-up study. At present, there are few studies on the expression of immunoglobulin in patients with endometriosis, so the results have yet to be further explored and verified. At present, high quality nursing has achieved good effects in many gynecological diseases such as postpartum hemorrhage in pregnancy-induced hypertension syndrome [28], myoma of the uterus [29], and cervical erosion [30], etc.. Whether similar effects will be observed in patients with endometriosis still needs to confirm by future studies.

In summary, the application of high quality nursing in the perioperative period of patients with endometriosis can effectively improve the operation results, reduce adverse effects, and improve the patients' negative emotions, medication compliances, nursing satisfactions, and immune functions: thus it has clinical value. However, the reasons for the differences between the results in the test group and some other studies are not further explored, we hope that the other scholars can expand the sample size and carry out subsequent multi-center research to provide more data for the application of high quality nursing in the patients with endometriosis.

Disclosure of conflict of interest

None.

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