

Original Article

Personalized nursing improves adverse pregnancy outcomes and adverse neonatal outcomes of pregnancy in patients with aerobic vaginitis

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Abstract: Objective: This study aimed to explore the effect of personalized nursing on unhealthy emotions, quality of life and pregnancy outcome for pregnant patients with aerobic vaginitis. Methods: One hundred pregnant patients with aerobic vaginitis who had been treated in our hospital were selected. A random number table was used to divide patients into group A and group B, with 50 patients in each group. Patients in group A were given routine nursing, and patients in group B were given personalized nursing. The scores from the Hamilton Depression Scale (HAMD), Hamilton Anxiety Scale (HAMA) and Quality of Life Score (SF-36) of the two groups were observed before and after nursing. After nursing, adverse pregnancy outcomes, adverse neonatal outcomes and nursing satisfaction of the two groups were observed. Results: There was no statistical difference in clinical data between the two groups ($P > 0.05$). After nursing, HAMD score and HAMA score of the two groups were improved, and HAMD score and HAMA score of group B were lower than group A. The difference value in group B was higher than group A ($P < 0.05$). After nursing, the SF-36 score and all functions in group A were lower than group B ($P < 0.05$). The difference between the before and after SF-36 scores in group B was greater than group A ($P < 0.05$). The adverse pregnancy outcomes of group B were lower than group A ($P < 0.05$), and adverse neonatal outcomes of group B were also lower than group A ($P < 0.05$). There was a difference in nursing satisfaction between the two groups as well ($P < 0.05$). Conclusion: Personalized nursing can effectively improve adverse pregnancy outcomes and adverse neonatal outcomes of pregnant patients with aerobic vaginitis, and this is suitable for clinical promotion.

Keywords: Gestation period, personalized nursing, clinical efficacy, nursing satisfaction

Introduction

Female genital tract infection is a common gynecological disease, and it has a serious impact on patients' physical and mental health [1]. In a study from Liu et al. [2], they analyzed the etiology of gynecological patients in 14 hospitals in China on July 15, 2004, and more than 50% of the patients were hospitalized for infectious diseases. Among these patients, vaginitis ranked first, accounting for 31.3% of all infectious diseases. With the development of society, the rising economic level, and with the opening of the Two-child policy, the number of pregnant women is increasing [3, 4], and the number of pregnant patients with aerobic vaginitis is also increasing. Vaginal bacterial infection is the most common infection disease [5]. Vaginal disease is divided into bacterial vaginosis

caused by anaerobic bacteria, and aerobic vaginitis caused by aerobic bacteria [6]. Foreign studies showed that [7] aerobic vaginitis can cause adverse pregnancy outcomes, and it seriously influences the life quality of mothers and newborns.

At present, there is no specific conclusion about the treatment of pregnant patients with aerobic vaginitis, but nursing intervention can effectively improve the treatment effects and recovery [8]. However, due to the improvement of people's living standards, routine nursing no longer meets patients' needs. Therefore, clinical staff is finding new nursing methods to improve the nursing effect. Personalized nursing is a new nursing mode in recent years. It takes a patient-centered principle, and a nursing plan is formulated according to patients'

needs and conditions [9]. Research showed that [10, 11] personalized nursing could improve the condition of many diseases. However, it is still not clear whether personalized nursing can improve adverse pregnancy outcomes in pregnant patients with aerobic vaginitis.

Therefore, this study explored the effect of personalized nursing on pregnant patients with aerobic vaginitis and the effect on pregnancy outcomes, to provide references for medical staff.

Methods and materials

The number of patients

One hundred cases of pregnant women with aerobic vaginitis in our hospital were selected. A random number table was used to divide patients into group A and group B, and 50 patients were in each group. The average age of group A was 31.25 ± 3.21 years old, and the average age of group B was 32.55 ± 3.91 years old. This study was approved by the Medical Ethics Committee of The First Affiliated Hospital of Xi'an Jiaotong University.

Inclusion and exclusion criteria

Inclusion criteria: All patients were diagnosed with aerobic vaginitis through bacteriological detection, and it was conformed to the diagnostic criteria of aerobic vaginitis proposed by Tempera et al. [12]; all patients were pregnant woman; all patients delivered in our hospital; the clinical data of patients were complete; patients cooperated with the treatment and nursing; all patients and their families were informed, and all patients signed informed consent.

Exclusion criteria: Patients with heart, lung, liver or kidney deficiencies; patients with other infections; patients who used anti-inflammatory or anti-infective drugs before nursing and treatment; patients who used vaginal lubricants within 3 days before being hospitalized; patients who had sex within a 2 week period before being hospitalized.

Nursing plan

Routine nursing was given to both groups, and personalized nursing was given to group B. Routine nursing intervention was as follows: vital signs test, health education, environmen-

tal nursing, dietary guidance, self-medication guidance, etc. Personalized nursing: 1) Health guidance education: disease-related knowledge and health education were introduced to patients and their families, and nursing staff had in-depth communication with patients, to understand the patient's disease situation. 2) Psychological intervention: after being hospitalized, patients were usually afraid that the disease could not be effectively treated, so anxiety and depression could occur. Medical staff communicate with patients modestly and graciously. They encourage patients and help them build up their confidence, to make patients overcome the disease and eliminate negative emotions. 3) Personal hygiene education: aerobic vaginitis is mostly caused by poor personal hygiene, so it is necessary to instruct patients to maintain personal hygiene and to keep the vagina dry and clean. Patients should use cotton underwear and avoid spicy or cold food. Patients need more outdoor interaction and exercise to increase self-immunity. Sexual behavior should be avoided during treatment. 4) Medication guidance: medical staff guide patients to use medicine in the vagina. The nursing process was guided by a specialist physician. During the cleaning process, 4% sodium bicarbonate was used, and a sterile endoscope was used to put the tablet into vagina. Sterile oval clip was used to take 0.3% of chlorhexidine cotton balls, to wash around the vagina and fornix. The corners of the vagina should be wiped thoroughly. Then a dry cotton ball was used to wipe again. Finally, 1 tablet of Clindamycin Pireate Vaginal Effervescent Tablets was inserted into the vagina.

Therapeutic regimen

One tablet of Clindamycin Pireate Vaginal Effervescent Tablets was given to the patient, and the patient was guided to use the medicine. The medicine would be used once a night, and one week was the course of treatment. After one-week of treatment, if re-examination results were still positive, another course of treatment was given. Re-examination was carried out one week after stopping the medicine.

Outcome measures

Main outcome measures: The changes of patients' unhealthy emotions before and after nursing was observed; Hamilton Depression Scale (HAMD) was used to detect patients' depres-

Effect of personalized nursing

Table 1. Comparison of clinical data [n (%)]

Factor		A Group (n = 30)	B Group (n = 30)	t/x ² value	P value
Age (years)		31.25 ± 3.21	32.55 ± 3.91	1.408	0.165
BMI (kg/m ²)		23.54 ± 1.84	23.19 ± 1.59	0.788	0.434
Anamnesis	COPD	4 (13.33)	2 (6.67)	0.741	0.389
	Diabetes mellitus	5 (16.67)	3 (10.00)	0.577	0.448
Smoking history	Yes	6 (20.00)	8 (26.67)	0.373	0.542
	No	24 (80.00)	22 (73.33)		
History of alcoholism	Yes	3 (10.00)	1 (3.33)	1.071	0.301
	No	27 (90.00)	29 (96.67)		
Degree of education	≥ University	12 (40.00)	17 (56.67)	1.669	0.197
	< University	18 (60.00)	13 (43.33)		
Delivery conditions	Multipara	15 (50.00)	10 (33.33)	1.714	0.19
	I-para	15 (50.00)	20 (66.67)		
Marital status	Married	26 (86.67)	29 (96.67)	1.964	0.161
	Unmarried	4 (13.33)	1 (3.33)		

Note: COPD: Chronic obstructive pulmonary disease.

sion condition; Hamilton Anxiety Scale (HAMA) was used to detect patients' anxiety; SF-36 score was used to compare the changes of quality of life before and after nursing in the two groups; pregnancy outcomes were observed (abortion, premature delivery and premature rupture of membranes were considered as adverse pregnancy outcomes).

Secondary outcome measures: The distribution of pathogens and nursing satisfaction of the two groups were observed. A six-week follow-up survey was conducted to observe neonatal outcomes. The clinical data of the two groups were compared.

Statistical methods

SPSS 20.0 software was used to analyze the collected data, and GraphPad Prism 7 software was used to draw relevant pictures, and K-S was used to analyze the distribution of data. Counting data was expressed as rate (%), and Chi-square test was expressed as χ^2 . When the number of events was less than 5, or the result of subtracting the number of events from the number of trials was less than 5, Fisher exact test was used. Rank data were tested by non-parametric test, and it was expressed as Z. Measuring data were expressed as mean ± standard deviation (SD ± meas). T-test was used for normal distribution data, and paired t-test was used for comparison within group before and after treatment. Independent sample t-test was used to compare results between

groups before and after treatment, and the results were expressed as t. Rank sum test was used for data that did not conform to normal distribution, and the results were expressed as Z. There was statistical difference when $P < 0.05$.

Results

Comparison of clinical data

The clinical data of the two groups were collected and compared. There were no differences in age, BMI, past medical history, smoking history, history of alcoholism, education level, delivery conditions and marital status between the two groups ($P > 0.05$) (**Table 1**).

Changes of anxiety and depression scores before and after nursing

Before nursing, there was no difference in HAMD and HAMA scores between the two groups ($P > 0.05$). After nursing, scores of HAMD and HAMA in both groups were improved, and scores of HAMD and HAMA in group B were lower than group A. Besides, the variation of score difference before and after in group B was greater than group A ($P < 0.05$) (**Table 2** and **Figure 1A, 1B**).

Changes of life quality of patients

Before nursing, there was no difference in SF-36 score ($P > 0.05$). After nursing, SF-36 score in both groups were improved, and SF-36 sco-

Effect of personalized nursing

Table 2. Changes of anxiety and depression scores before and after nursing

Group	HAMA score			HAMD score		
	Before nursing	After nursing	D-value	Before nursing	After nursing	D-value
B Group (n = 30)	29.44 ± 3.55	22.15 ± 2.65*	7.29 ± 3.22	28.77 ± 2.94	23.11 ± 3.02*	5.66 ± 2.22
A Group (n = 30)	29.15 ± 3.81	15.54 ± 3.12*	13.61 ± 4.39	28.81 ± 3.15	16.25 ± 2.11*	12.56 ± 4.15
t value	0.695	11.418	8.208	0.066	13.167	10.367
P value	0.394	< 0.001	< 0.001	0.948	< 0.001	< 0.001

Note: *difference between before nursing and after nursing (P < 0.05).

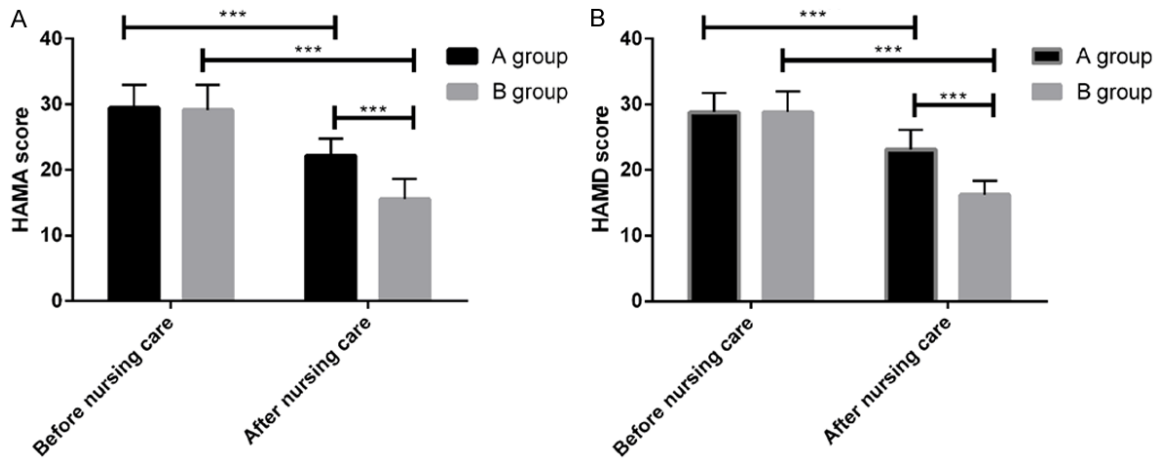


Figure 1. The changes of HAMA and HAMD scores before and after nursing. A. The changes of HAMA score before and after nursing. ***means P < 0.001. B. The changes of HAMD score before and after nursing. ***means P < 0.001.

Table 3. Changes of life quality of patients

Function	A Group (n = 30)			B Group (n = 30)		
	Before nursing	After nursing	D-value	Before nursing	After nursing	D-value
Somatic function	55.25 ± 4.35	69.54 ± 5.14*	14.29 ± 4.25	54.21 ± 4.22	78.65 ± 5.84* [#]	24.44 ± 6.88 ^Δ
Social function	57.39 ± 3.33	68.24 ± 6.22*	10.85 ± 3.21	56.14 ± 4.00	76.21 ± 6.22* [#]	20.07 ± 5.21 ^Δ
Ymotional function	43.98 ± 4.10	58.22 ± 4.29*	14.24 ± 4.05	44.95 ± 3.58	70.33 ± 5.31* [#]	25.38 ± 6.58 ^Δ
Health condition	52.69 ± 4.15	63.25 ± 5.95*	10.56 ± 3.19	53.29 ± 3.69	75.62 ± 6.02* [#]	22.33 ± 5.84 ^Δ

Note: *difference between group B and group A was significant (P < 0.05), [#]difference between group B and group A was significant (P < 0.05), ^Δdifference between group B and group A was significant (P < 0.05).

re in group A was lower than group B (P < 0.05). The variation of before and after difference of SF-36 score in group B was greater than group A (P < 0.05) (Table 3).

Pregnancy outcomes and neonatal outcome of two groups

In group A, there were 3 cases of abortion, 3 cases of premature delivery and 2 cases of premature rupture of membranes. In group B, there were 1 case of abortion, 0 case of premature delivery and 1 case of premature rupture of membranes. The adverse pregnancy out-

comes in group B were less than group A (P < 0.05, Table 4). For neonatal outcomes, in group A, there were 2 cases of neonatal sepsis, 4 cases of pneumonia and 1 case of cerebral palsy; in group B, there was 1 case of neonatal sepsis, 1 case of pneumonia and 0 cases of cerebral palsy. The total incidence of adverse neonatal outcomes in group A was higher than group B (P < 0.05) (Table 5).

Comparison of nursing satisfaction

After nursing, patients in the two groups received a satisfaction evaluation. In group B, 15

Effect of personalized nursing

Table 4. Pregnancy outcomes of two groups [n (%)]

Group	Abortion	Premature birth	Premature rupture of fetal membranes	Adverse pregnancy outcome
B Group (n = 30)	1 (3.33)	0 (0.00)	0 (0.00)	1 (3.33)
A Group (n = 30)	3 (10.00)	3 (10.00)	2 (6.67)	8 (26.67)
χ^2 value	-	-	-	-
P value	0.612	0.237	0.492	0.026

Table 5. Neonatal outcome of two groups [n (%)]

Group	Sepsis	Pneumonia	Cerebral palsy	Neonatal adverse outcome
B Group (n = 30)	0 (0.00)	1 (3.33)	0 (0.00)	1 (3.33)
A Group (n = 30)	3 (10.00)	4 (13.33)	1 (3.33)	8 (26.67)
χ^2 value	-	-	-	-
P value	0.237	0.353	> 0.999	0.026

Table 6. Comparison of nursing satisfaction

Group	Very satisfied	Satisfied	Unsatisfied	Z value	P value
B Group (n = 30)	15 (50.00)	12 (43.33)	3 (6.67)	-2.179	0.029
A Group (n = 30)	9 (30.00)	12 (40.00)	9 (30.00)		

cases were very satisfied, 12 cases were generally satisfied, and 3 cases were unsatisfied. In group A, 10 cases were very satisfied, 12 cases were generally satisfied, and 8 cases were unsatisfied. There was a difference in nursing satisfaction between the two groups ($P < 0.05$, **Table 6**).

Discussion

Maternal diseases are very important in the clinic. In recent years, with the opening of the Two-child policy in China, the number of pregnant and lying-in women has been rising [13]. Reproductive tract infections seriously threaten the health of the female reproductive tract. Studies have shown that [14] genital tract infections can cause infertility, abortion, premature delivery, intrauterine infection and even cervical cancer. Vaginitis is the most common genital tract infection disease. According to different pathogenic bacteria, vaginitis is divided into aerobic vaginitis, anaerobic vaginitis and facultative anaerobe vaginitis. Among them, aerobic vaginitis is the most common one found in clinic [15].

During pregnancy, the vaginal pH and flora change, and the increase of female hormo-

ne causes the increase of glycogen content in vaginal epithelial cells. Increased lactic acid is conducive to the growth of acid pathogens, and patients easily get infected. It has influence on both the patient and the embryo [16, 17], so clinical treatment is particularly important. However, there is still no standard treatment for pregnancy with aerobic vaginitis. To a certain extent, nursing intervention can effectively improve the clinical curative effect and accelerate the improvement. However, with the development of society and the improvement of economic levels, the demand for nursing has been increasing. Routine nursing has been unable to meet patients' needs. Therefore, medical staff need to find out new nursing plans to improve the situation.

In this study, personalized nursing and routine nursing were carried out in parallel. Personalized nursing is a designated corresponding care plan based on different conditions of the patients, it can meet the individual needs of each patient, and it also emphasizes people-oriented medicine [18]. By comparing the changes of HAMD and HAMA scores before and after nursing, we found that there was no difference between the two groups before nursing. After nursing, HAMD and HAMA scores of the two groups had been improved, and variations before and after in group B was greater than group A. This indicated that personalized nursing could effectively improve patients' anxiety and depression condition. HAMD and HAMA scores are the most common anxiety and depression scoring criteria in clinic, and the accuracy has been confirmed in a variety of clinical studies [19]. If women suffer from infections and related diseases during pregnancy, they can easily get anxiety and depression. Unhealthy emotions have great impact on the development and growth of infants [20]. This problem was effectively solved through nursing intervention, and the effect of personalized nursing is clear. It also showed that health education helps patients have an in-depth under-

standing of their own condition, and patients' trust in medical staff has also improves. This is conducive to the progress of treatment and nursing work [21]. Psychological intervention can effectively alleviate unhealthy emotions of patients. Besides, targeted psychological counseling is conducted according to each patients' emotion. In this way, patients are confident in conquering diseases, and thus the treatment compliance as well as the curative effect are enhanced [22].

Life quality of patients before and after nursing was also compared. After nursing, differences of SF-36 score and all functions in group B were higher than group A. It indicated that personalized nursing can effectively improve the quality of life of patients. The SF-36 score is used for assessing the quality of life of patients in clinic. SF-36 score has been used to assess life quality of pregnant women in many experiments [23, 24]. Through personalized nursing, quality of life of patients was effectively improved, and it suggested that personalized nursing could effectively improve quality of life of patients. Through personal hygiene education, unhealthy habits of patients were effectively improved, and patients were reliable in taking their medications. Moreover, patients did not need to go to clinics or hospitals for minor procedures so unnecessary expenses were reduced.

At the end of the study, adverse pregnancy outcomes and neonatal outcomes between two groups were compared. Although there was no difference between the two groups in individual factors, the total incidence of adverse pregnancy outcomes and adverse neonatal outcomes in group A were higher than group B. It suggested that personalized nursing can improve adverse pregnancy outcomes and adverse neonatal outcomes. In Tansarli GS's study [25], intensive care can effectively improve adverse pregnancy outcomes and adverse neonatal outcomes, while personalized nursing has the same effects. It indicated that personalized nursing can improve adverse pregnancy outcomes and adverse neonatal outcomes in pregnant patients with aerobic vaginitis. By comparing the nursing satisfaction of the two groups, the nursing satisfaction of group B was higher than group A. It also suggests that personalized nursing can improve nursing satisfaction, and it has the same results as a study from Tekin et al. [26].

In conclusion, personalized nursing can effectively improve adverse pregnancy outcomes and adverse neonatal outcomes of pregnant patients with aerobic vaginitis, and personalized nursing is suitable for clinical promotion.

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Disclosure of conflict of interest

None.

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Effect of personalized nursing

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