

Long-Term Management of Endometriosis Based on Third Party Platform

Jialan Chen¹, Zhuo Deng¹, Xin Shen¹, Qinfeng Liu^{2,*}, Lihong Chen¹

¹Department of Gynecology, Shaanxi Provincial People's Hospital, Xi'an, Shaanxi, China

²Medical Equipment Management Department, Shaanxi Provincial People's Hospital, Xi'an, Shaanxi, China

*Corresponding author

Abstract: *Objective: To explore the effect of long-term management of endometriosis (EMs) patients based on third-party platform. Methods: From June 2019 to December 2020, 200 endometriosis patients who were admitted to the gynecology clinic and ward of Shaanxi Provincial People's Hospital were selected. Among them, 100 patients who voluntarily used the third-party platform and regularly visited the hospital were selected as the experimental group, and 100 patients who were followed up for routine outpatient service were selected as the control group. The pain numerical rating scale (NRS), self-rating depression scale (SDS), self-rating anxiety scale (SAS), cyst diameter and EMS disease cognition were compared between the two groups, which were collected every three months. Results: The data at each time point (NRS score, SDS score, SAS score, cyst diameter, EMS disease cognition) of experimental group and control group after management were significantly decreased compared with those before management and at the previous time point, and the difference was statistically significant ($P < 0.05$), however, there was significant difference in the on-time follow-up rate between the two groups ($P < 0.05$). Conclusion: The use of third-party platforms can significantly improve the long-term management effect of EMs patients.*

Keywords: Endometriosis, Management mode, Third-party platform

1. Introduction

With the in-depth understanding of the occurrence and development of endometriosis, endometriosis has become a social problem that endangers the health of world's women. Because of unclear etiology, difficult to remove, biological behavior similar to malignant tumors and the mental, psychological and physiological harm to women, it has become another chronic disease in the field of gynecology, which needs long-term and even lifelong management. However, there is no mature, effective and standardized long-term management scheme at home and abroad [1, 2]. In this study, the long-term follow-up of patients with endometriosis was established and implemented on a third-party platform, which can significantly improve patients' awareness of the disease and increase patients' participation in their own disease diagnosis and treatment and long-term management. It also can increase the trust between doctors and patients, and saved the cost of disease management for doctors.

2. Object and methods

2.1. Object

Patients with endometriosis who were admitted to the gynecological clinic and ward of Shaanxi Provincial People's Hospital from June 2019 to December 2020 were selected as subjects.

(1) Inclusion criteria: Consistent with the items of 1), 2) and any item from 3) to 6). 1) The woman was in adolescence, childbearing age and perimenopausal period. 2) The patients can use the smart phones pay attention to the third party platform voluntarily, which can be used to learn the relevant scientific knowledge published by doctors and communicate with doctors about disease management. 3) Endometrial implantation cyst was showed by B-ultrasound or MRI. 4) The woman was with dysmenorrhea and painful nodules of posterior vaginal vault. 5) The woman was with sexual intercourse pain or post-sexual intercourse pain with painful tubercle of posterior vaginal dome. 6) Endometriosis is

confirmed by laparoscopic exploration.

(2) Exclusion criteria: 1) Endometriosis was ruled out after repeated examinations by B-ultrasound or MRI. 2) The woman was suspected of tumor malignancy with the elevation of marker CA125 and HE4. 3) The patients were unable to cooperate with dynamic communication due to various reasons.

2.2. Methods

A prospective study was conducted to enlist the endometriosis patients diagnosed by clinical diagnosis and postoperative diagnosis. Control group strengthened hospital education, and an internet connection of doctor-patient was established by the third-party medical platform on the basis of education in the experimental group. Both groups were evaluated comprehensively from the aspects of symptoms and signs, psychological conditions and disease cognition every three months for a year.

1) Grouping method: 100 women who voluntarily paid attention to third-party platforms, used the third-party platforms to learn doctors to relevant scientific knowledge from doctors, communicate dynamically with doctors about disease management and came to the hospital for regular check-ups were selected as the experimental group. And 100 patients followed up routinely were selected as control group.

2) Intervention method: Both groups were given a systematic education of the disease by the disease administrator at the first diagnosis, including the concept, symptoms, risk factors, hazard and careful precautions of endometriosis, the purpose and necessity of each inspection, and the objectives, principles and necessities of long-term management. Besides, the time and content of follow-up, psychological counseling and corresponding counseling measures were also told to patients.

Experimental group: An online management group composed of senior doctors and nurses who are good at diagnosis and management of endometriosis was established. After that, the patients are taught the use of the third-party platform by nurse, which includes learning of science knowledge and consulting online. Then the patients were asked to complete the relevant questionnaire and record relevant data before the experiment. The doctor's task is to improve the content of online science, solve the problems online, provide outpatient office visits and manage the patients.

Control group: The related questionnaire before experiment was completed after the education, and it was recorded by the nurses. Then an approximate follow-up time was arranged.

3) Data collection and analysis

(1) The basic information of both groups was collected, such as age, educational level, diagnostic methods, pre-treatment pain score, cyst diameter, depression score and anxiety score. And the information differences between both groups of the disease questionnaire after education were evaluated. (2) The follow-up information of pain score, cyst maximum diameter, anxiety and depression self-scores of the two groups after treatment were collected every three months. Further, the information of disease cognition questionnaire of the patients was collected one year later. The comparison between the two groups was carried out to evaluate the effect of patient management methods in the long-term management of endometriosis.

3. Statistical method

The research data was processed by SPSS 25.0 software. The measurement data were represented by paired-samples T-tests ($\bar{x} \pm s$), and the count data were represented by (%). The comparison between groups was performed by χ^2 test, and $P < 0.05$ indicated that the difference was statistically significant.

4. Results

4.1. General data

The data before management were compared between the two groups (including age, educational level, diagnostic method, pain score before treatment, cyst diameter, depression score, anxiety score and EM's disease cognition). The results showed that there was no statistically significant difference in the data between the two groups ($P > 0.05$), as shown in Table 1.

Table 1: Comparison of basic data of two groups

Item	Experimental group(n=100)	Control group(n=100)	T/ χ^2 value	P value
Age (year, $\bar{x} \pm s$)	33.72 \pm 7.738	34.57 \pm 7.567	-0.735	0.464
Educational level (number, %)			0.730	0.981
Primary school	5(5)	7(7)		
Junior high school	12(12)	13(13)		
High school	24(24)	21(21)		
Undergraduate (including college)	39(39)	37(37)		
Master	13(13)	14(14)		
Doctor	7(7)	8(8)		
Diagnostic method (number, %)			0.960	0.327
pathological diagnosis	28(28)	22(22)		
clinical diagnosis	72(72)	78(78)		
Pain NRS score before (score, $\bar{x} \pm s$)	5.00 \pm 2.701	5.06 \pm 2.719	-0.145	0.885
Cyst diameter (score, $\bar{x} \pm s$)	44.09 \pm 7.382	42.81 \pm 7.000	1.327	0.188
Depression score (score, $\bar{x} \pm s$)	51.90 \pm 11.413	50.59 \pm 7.669	1.044	0.299
Anxiety core (score, $\bar{x} \pm s$)	51.51 \pm 8.898	53.49 \pm 8.556	-1.682	0.096
EM's disease cognition (score, $\bar{x} \pm s$)	31.30 \pm 13.681	31.93 \pm 15.293	-0.305	0.761

4.2. Pain numerical rating scale (NRS) score

As shown in Table 2, the NRS score of control group was 5.06 \pm 2.719 before management. It was scored every three months after management; the latter score was significantly lower than the previous time and the difference was statistically significant ($P < 0.05$). The NRS score of the experimental group was 5.00 \pm 2.701 before management. It was also scored every three months after management, the latter score was significantly lower than those before management and the previous time, and the difference was also statistically significant ($P < 0.05$). However, there was no significant difference in pain scores between the two groups before and after 12 months of intervention ($P > 0.05$).

Table 2: Comparison of NRS score

Group	Number	$\bar{x} \pm s$	P value	Group	Number	$\bar{x} \pm s$	P value
EGp before management	100	5.00 \pm 2.701	0.885	EGp after 12 months management	61	2.69 \pm 1.689	0.801
CGp before management		5.06 \pm 2.719		CGp after 12 months management		2.77 \pm 1.657	
EGp before management	81	4.80 \pm 2.813	0.000	CGp before management	61	5.08 \pm 2.801	0.000
EGp after 12 months management		2.58 \pm 1.604		CGp after 12 months management		2.77 \pm 1.657	
EGp before management	84	4.87 \pm 2.793	0.000	CGp before management	70	5.04 \pm 2.721	0.000
EGp after 3 months management		4.24 \pm 2.383		CGp after 3 months management		4.36 \pm 2.396	
EGp after 3 months management	82	4.23 \pm 2.410	0.000	CGp after 3 months management	60	4.35 \pm 2.510	0.000
EGp after 6 months management		3.30 \pm 1.877		CGp after 6 months management		3.48 \pm 1.996	
EGp after 6 months management	85	3.35 \pm 1.863	0.000	CGp after 6 months management	57	3.42 \pm 1.973	0.000
EGp after 9 months management		2.66 \pm 1.659		CGp after 9 months management		2.89 \pm 1.749	
EGp after 9 months management	81	2.73 \pm 1.666	0.001	CGp after 9 months management	58	2.88 \pm 1.748	0.006
EGp after 12 months management		2.58 \pm 1.604		CGp after 12 months management		2.72 \pm 1.631	

Remarks: EGp: experimental group, CGp: Control group

4.3. Self-rating depression scale (SDS)

As shown in Table 3, the SDS score of experimental groups before management was 51.90 \pm 11.413. After management, the SDS scores of patients at each time node were significantly lower than those before management and the previous time node, and the difference was statistically significant, $P < 0.05$.

The SDS score of experimental groups before management was 50.59 ± 7.669 . The SDS scores of patients after management at each time node were significantly lower than those before management and the previous time node, and the difference was statistically significant, $P < 0.05$. Further, there was no significant difference between the two groups before the intervention ($P > 0.05$), however, the difference had statistical significance after the intervention ($P < 0.05$).

Table 3: Comparison of SDS score

Group	Number	$\bar{x} \pm s$	P value	Group	Number	$\bar{x} \pm s$	P value
EGp before management	100	51.90 ± 11.413	0.299	EGp after 12 months management	64	33.75 ± 6.643	0.005
CGp before management		50.59 ± 7.669		CGp after 12 months management		36.63 ± 4.627	
EGp before management	81	51.69 ± 11.671	0.000	CGp before management	64	49.47 ± 7.580	0.000
EGp after 12 months management		33.17 ± 6.475		CGp after 12 months management		36.63 ± 4.627	
EGp before management	83	51.76 ± 11.549	0.000	CGp before management	70	49.67 ± 7.358	0.000
EGp after 3 months management		48.54 ± 8.971		CGp after 3 months management		46.07 ± 5.754	
EGp after 3 months management	81	48.52 ± 9.064	0.000	CGp after 3 months management	61	46.26 ± 5.924	0.000
EGp after 6 months management		44.20 ± 7.398		CGp after 6 months management		43.62 ± 5.791	
EGp after 6 months management	85	44.33 ± 7.259	0.000	CGp after 6 months management	59	43.75 ± 5.646	0.000
EGp after 9 months management		39.14 ± 6.167		CGp after 9 months management		40.69 ± 5.509	
EGp after 9 months management	81	39.12 ± 6.270	0.000	CGp after 9 months management	62	40.58 ± 5.385	0.000
EGp after 12 months management		33.17 ± 6.475		CGp after 12 months management		36.73 ± 4.406	

Remarks: EGp: experimental group, CGp: Control group

4.4. Self-rating anxiety scale (SAS)

Table 4: Comparison of SAS score

Group	Number	$\bar{x} \pm s$	P value	Group	Number	$\bar{x} \pm s$	P valueE
EGp before management	100	51.51 ± 8.898	0.096	EGp after 12 months management	64	36.33 ± 5.936	0.000
CGp before management		53.49 ± 8.556		CGp after 12 months management		40.56 ± 5.580	
EGp before management	81	51.91 ± 9.527	0.000	CGp before management	64	53.89 ± 8.720	0.000
EGp after 12 months management		36.14 ± 5.533		CGp after 12 months management		40.56 ± 5.580	
EGp before management	83	51.98 ± 9.421	0.000	CGp before management	70	53.74 ± 8.731	0.000
EGp after 3 months management		49.10 ± 8.417		CGp after 3 months management		50.41 ± 7.662	
EGp after 3 months management	81	49.07 ± 8.519	0.000	CGp after 3 months management	62	50.63 ± 7.629	0.000
EGp after 6 months management		44.73 ± 6.325		CGp after 6 months management		47.87 ± 6.674	
EGp after 6 months management	85	44.60 ± 6.243	0.000	CGp after 6 months management	60	47.90 ± 6.516	0.000
EGp after 9 months management		40.31 ± 5.860		CGp after 9 months management		44.60 ± 6.040	
EGp after 9 months management	81	40.49 ± 5.910	0.000	CGp after 9 months management	62	44.82 ± 6.208	0.000
EGp after 12 months management		36.14 ± 5.533		CGp after 12 months management		40.60 ± 5.609	

Remarks: EGp: experimental group, CGp: Control group

As shown in Table 4, the SAS score of experimental groups before management was 51.51 ± 8.898 points. After management, the scores of patients at each time node were significantly lower than those

before management and the previous time node, and the difference was statistically significant, $P < 0.05$. The SAS score of experimental groups before management was 53.49 ± 8.556 points. And the scores of patients at each time node after management were significantly lower than those before management and the previous time node, and the difference was statistically significant $P < 0.05$. Moreover, there was no significant difference in the scores between the two groups before the intervention ($P > 0.05$), while the scores of the two groups decreased after intervention, and the difference was statistically significant ($P < 0.05$).

4.5. Cyst diameter before and after treatment

As shown in Table 5, the cyst diameter of experimental group before management was 44.09 ± 7.382 mm, and the value after management was significantly lower than that before management and the previous time point with statistical significance ($P < 0.05$). While the cyst diameter of control group was 42.81 ± 7.000 mm before management, and the cyst diameter after management was significantly lower than that before management and the previous time point, and the difference was statistically significant, $P < 0.05$. Further, the scores of two groups after intervention were lower than those before, however the difference was not statistically significant ($P > 0.05$).

Table 5: Comparison of cyst diameter

Group	Number	$\bar{x} \pm s$	P value	Group	Number	$\bar{x} \pm s$	P value
EGp before management	100	44.09±7.382	0.188	EGp after 12 months management	64	23.33±1.448	0.145
CGp before management		42.81±7.000		CGp after 12 months management		26.56±3.720	
EGp before management	81	44.30±7.286	0.000	CGp before management	64	43.16±7.167	0.000
EGp after 12 months management		22.09±12.175		CGp after 12 months management		26.56±3.720	
EGp before management	83	44.35±7.208	0.000	CGp before management	70	43.11±6.952	0.000
EGp after 3 months management		34.33±17.314		CGp after 3 months management		34.06±16.520	
EGp after 3 months management	81	34.09±17.460	0.000	CGp after 3 months management	61	33.74±16.944	0.000
EGp after 6 months management		31.49±16.233		CGp after 6 months management		32.38±16.066	
EGp after 6 months management	85	31.78±15.928	0.000	CGp after 6 months management	59	32.29±16.260	0.000
EGp after 9 months management		28.48±14.392		CGp after 9 months management		29.25±14.951	
EGp after 9 months management	81	28.25±14.646	0.001	CGp after 9 months management	62	29.19±15.194	0.000
EGp after 12 months management		22.09±12.175		CGp after 12 months management		26.44±13.901	

Remarks: EGp: experimental group, CGp: Control group

4.6. EMS disease cognition

It can be seen from Table 6 that there was no significant difference in EMS disease cognition between the two groups before intervention ($P > 0.05$). After the intervention, the scores of the two groups were lower than those before intervention. There were significant differences in both groups before and after intervention and the two groups after intervention ($P < 0.05$).

Table 6: Comparison of disease cognition

Group	Number	$\bar{x} \pm s$	P value	Group	Number	$\bar{x} \pm s$	P value
EGp before management	81	30.370±13.556	0.000	CGp before management	66	33.379±15.103	0.000
EGp after 12 months management		61.204±25.078		CGp after 12 months management		56.212±23.077	
EGp before management	100	31.300±13.681	0.761	EGp after 12 months management	66	66.174±23.371	0.000
CGp before management		31.930±15.294		CGp after 12 months management		56.212±23.077	

4.7. Overall management effect

We can see from Table 7 that the follow-up rates of 100 patients in experimental group at 0, 3, 6, 9 and 12 months were 100 %, 83 %, 85 %, 87 % and 81 %, respectively. While the follow-up rates of 100

patients in the control group at 0, 3, 6, 9 and 12 months were 100 %, 70 %, 66 %, 66 % and 61%, respectively. Obviously, the follow-up rate between the two groups had significant difference, and there was statistical significance ($P < 0.05$).

Table 7: Comparison of follow-up rate

Group	Number	Mean	standard deviation	P value
Experiment group	5	87.20	7.497	0.020
Control group	5	72.60	15.646	

5. Discussion

Endometriosis has the following features: extensive lesion, diverse form, unknown etiology, and it is defined as a refractory disease for its high recurrence rate and difficult to cure, and with the characteristics similar to malignant tumors such as invasiveness, metastasis and recurrence [3-6]. In recent years, with the in-depth understanding of endometriosis, it has risen from a common disease in women of childbearing age to a worldwide health problem. It not only increases the burden of health resources, but also seriously endangers the health life of patients. The daily work of obstetrics and gynecology doctors in China is relatively busy. How to effectively manage patients in working leisure is one of the urgent problems to be solved. Due to the wide application of smart phones, and related third-party platforms are more and more widely used [7]. Based on the third-party platform, this study explores a long-term management model for endometriosis patients, which is suitable for national situation.

In this study, 200 patients with endometriosis diagnosed by clinic or surgery were taken as the research object, and the long-term management lasted for one year. Taking 3 months as a time node, the relevant data of patients were collected regularly, and the data of experimental group and control group were statistically analyzed. The results showed that the data (including NRS score, SDS score, SAS score, cyst diameter and EMS disease cognition) of the two groups after management were significantly decreased compared with those before management, the data of latter time node was also significantly decreased compared with the previous time node, and all the difference were statistically significant ($P < 0.05$). Further, the subjective evaluation (such as SDS score, SAS score and EMS disease cognition) after one year intervention of the two groups were significantly different, and the difference showed statistical significance. For example, the scores of depressions and anxiety in experimental group were lower than those in control group, meanwhile, the scores of disease cognition questionnaire in the experimental group were higher. The objective evaluation data showed that (RS score and cyst diameter) in both groups decreased significantly, but there was no significant difference of the 12th month. It is thus clear that no matter what kind of management method is used, if patients can adhere to the treatment, the treatment effect is objectively equivalent. Moreover, from the overall management effect, the follow-up rate at each time point in experimental group was significantly higher than that in control group, and the difference between the two groups was statistically significant. It can be seen that the method used in experimental group can better realize the management of patients.

In addition, the difference of management effect between the two groups was considered to be related to the fluctuation of new coronary pneumonia epidemic. Many patients who need offline treatment have delayed the treatment or referral due to the epidemic control and other reasons. Patients who use third-party platforms can freely communicate with doctors online during the epidemic period, and learn the scientific knowledge released online, which helps improve the patient compliance. Moreover, patients learn more knowledge and benefit from the treatment (such as significant pain relief), which helps reduce depression and anxiety psychologically, forming a positive cycle and promoting each other, so that a virtuous cycle will be formed and promoted.

References

- [1] Leng JH, Dai Y, Li XY. New concept of diagnosis and treatment of endometriosis [J]. *Chinese Journal of Obstetrics and Gynecology*, 2021, 56(12): 831-835.
- [2] Chinese Obstetricians and Gynecologists Association. Guideline for the diagnosis and treatment of endometriosis (Third edition) [J]. *Chinese Journal of Obstetrics and Gynecology*, 2021, 56(12): 812-824.
- [3] Sun WW, Yu B, Liu Y, et al. Long-term management plan and principles of endometriosis [J]. *Chinese Journal of Health Management*, 2019, (03): 262-264.
- [4] Ji MM, Yuan M, Wang GY. Importance of patient education in the long-term management of

- endometriosis [J]. Chinese Journal of Practical Gynecology and Obstetrics, 2021, 37(03): 292-296.*
- [5] Xu CJ, Yi XF, Zheng YX. Long-term management strategy of endometriosis [J]. *Shanghai Medical Journal, 2019, 42(6): 340-343.*
- [6] Zhou YF. Necessity of long-term management of endometriosis patients [J]. *Chinese Journal of Obstetrics and Gynecology, 2017, 52(3): 145-146.*
- [7] Wang JY, Chen Y, Gu LL, et al. Analysis of the integrated management model of doctors, nurses and patients in patients with endometriosis [J]. *International Journal of Nursing, 2018, 37(4): 512-514.*