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Research

Analysis of the Relationship Between the Treatment Effect of the Levonorgestrel Intrauterine System and Pregnancy in Patients with Endometrial Hyperplasia

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Abstract **Objective**: To investigate the relationship between the treatment effect of the levonorgestrel intrauterine system (LNG-IUS) and pregnancy, and to assess the application of this treatment in endometrial hyperplasia. **Methods**: A total of 30 patients with endometrial lesions meeting the inclusion and exclusion criteria were selected from July 2021 to January 2024. Relevant data were collected for retrospective analysis, and patients were randomly divided into two groups of 15 each using a random number table. Both groups underwent placement of the LNG-IUS in the uterine cavity. The study group received endometrial biopsy under hysteroscopy, while the control group underwent traditional blind curettage. The collected data were analyzed statistically to compare the endometrial reversal rate, total treatment costs, postoperative pregnancy rate, number of uterine procedures, incidence of postoperative complications, and treatment efficacy between the two groups. **Results**: Comparison of endometrial reversal rates after different treatment regimens showed a higher reversal rate in the study group ($P>0.05$). Statistical analysis revealed that the study group had fewer procedures, lower total treatment costs, and higher postoperative pregnancy rates, with significant advantages compared to the control group ($P<0.05$). The incidence of postoperative complications was lower in the study group than in the control group ($P<0.05$), and the treatment efficacy was also higher in the study group ($P<0.05$). **Conclusion**: The implementation of LNG-IUS treatment combined with hysteroscopic endometrial biopsy shows better outcomes, significantly improving endometrial reversal rates and postoperative pregnancy rates, reducing the number of uterine procedures, decreasing complication rates, lowering total treatment costs, and enhancing treatment efficacy, thus demonstrating high promotional value.

Keywords*:* Levonorgestrel intrauterine system; endometrial hyperplasia; endometrial reversal rate; postoperative pregnancy rate; number of uterine procedures; complications; treatment efficacy

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Introduction

Endometrial hyperplasia has a high incidence and can be influenced by various factors. It is a non-physiological proliferation of the endometrium, resulting in an increase in endometrial quantity, with abnormal uterine bleeding being a clinical symptom that adversely affects patients' physical and mental health. In 2014, the World Health Organization classified endometrial hyperplasia into two categories based on the presence of cellular atypia, including atypical hyperplasia and non-atypical hyperplasia. Endometrial hyperplasia results from prolonged stimulation of the endometrium by unopposed estrogen, due to the lack of progesterone antagonistic action. Clinically, oral progestins are commonly used for treatment. However, prolonged treatment can increase the incidence of adverse drug reactions, and the disease is prone to

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relapse after discontinuation, negatively impacting disease management and prognosis, indicating certain limitations in application. Therefore, more effective treatment options are needed. The LNG-IUS has been shown to effectively improve clinical symptoms and is commonly used for treating endometrial hyperplasia in recent years, with high safety. This article evaluates the treatment value of 30 patients hospitalized from July 2021 to January 2024, aiming to provide guidance for future treatment work.

1. Data and Methods

1.1 General Data:

Thirty patients with endometrial lesions were divided into two groups of 15 each using a random number table. The study period was from July 2021 to January 2024, with groups labeled as study group and control group. In the control group, ages ranged from 33 to 41 years, with an average age of (36.29±2.19) years; disease duration ranged from 1 month to 7 years, with an average of (4.23±0.89) years. In the study group, ages ranged from 32 to 40 years, with an average age of (36.25±2.20) years; disease duration also ranged from 1 month to 7 years, with an average of (4.18±0.90) years. There was no statistically significant difference in general data between the two groups ($P>0.05$).

Inclusion Criteria: (1) Willingness to retain reproductive function; (2) Informed consent; (3) Presence of endometrial lesions; (4) Complete data; (5) Ability to communicate with relevant medical staff; (6) Good follow-up conditions; (7) Patients receiving initial treatment.

Exclusion Criteria: (1) Concurrent endometrial tuberculosis or uterine malformations; (2) Non-cooperation or withdrawal from the study; (3) Mental disorders; (4) Organic lesions; (5) Incomplete data; (6) Infectious diseases; (7) Recurrence after standardized treatment; (8) History of significant illness or allergies; (9) Progression to cancer during follow-up; (10) Failure to reverse endometrial lesions within 12 months of treatment.

1.2 Methods:

All eligible patients were informed and signed informed consent before LNG-IUS placement. For the control group (traditional blind curettage): after the first consultation, patients underwent a blind segmental curettage and IUD removal under intravenous anesthesia, followed by immediate re-insertion of the LNG-IUS upon pathology report on the first postoperative day. Monitoring continued every 3 months until two consecutive negative endometrial biopsies indicated treatment completion. For the study group (precise endometrial biopsy under hysteroscopy): after the first consultation, patients underwent endometrial biopsy under direct vision and were discharged on the same day after pathology reports confirmed endometrial reversal. This process continued until two consecutive negative biopsies indicated treatment completion.

If either group showed no change or worsening after two consecutive assessments, it was considered ineffective. The surgical protocol included routine vaginal washing preoperatively and administration of 0.4 mg misoprostol vaginally to soften the cervix under intravenous anesthesia. Hysteroscopy and endometrial biopsy were performed using a one-piece hysteroscope.

1.3 Observation Indicators:

Endometrial reversal rates were calculated for both groups, along with recording the number of procedures, total treatment costs, postoperative pregnancy rates, and

complications such as intrauterine adhesions, infections, and uterine perforations. Treatment efficacy was assessed as stable disease (SD), partial response (PR), complete response (CR), or progressive disease (PD).

1.4 Statistical Analysis:

All data were analyzed using SPSS 26.0. A P-value <0.05 was considered significant. Categorical data were analyzed using the Chi-square test, and continuous data were expressed as mean ± standard deviation and analyzed using the T-test.

2. Results

2.1 Comparison of Endometrial Reversal Rates:

Related comparative data indicate significant differences in endometrial reversal rates between the two groups, with the study group achieving higher rates (P>0.05).

Table 1: Comparison of Endometrial Reversal Rates Between Two Groups

Group	Number of Cases	Endometrial Reversal	Percentage
Study Group	15	15	100.00%
Control Group	15	13	86.67%
χ^2	-	-	2.1429
P	-	-	0.1432

2.2 Total treatment cost, number of intrauterine operations, and postoperative pregnancy rate:

See Table 2 for details: The study group had a higher postoperative pregnancy rate, lower total treatment cost and number of intrauterine operations, and the statistical analysis was significant (P<0.05).

Table 2: Comparison of Total Treatment Costs, Number of Uterine Procedures, and Postoperative Pregnancy Rates Between Two Groups

Group	Number of Cases	Postoperative Pregnancy Rate (%)	Number of Uterine Procedures (times)	Total Treatment Costs (CNY per hospitalization)
Study Group	15	12 (80.00%)	2.65±0.16	3855.38±412.23
Control Group	15	6 (40.00%)	4.52±0.15	5355.33±609.25
T	-	5.0000	33.0228	7.8972
P	-	0.0253	0.0000	0.0000

2.3 Incidence of postoperative complications:

The comparison of the incidence of postoperative complications between the two groups showed that the study group had a lower incidence, and the comparison was significant (P<0.05). See Table 3 for details:

Table 3: Comparison of Postoperative Complication Rates Between Two Groups

Group	Number of Cases	Uterine Perforation	Infection (Endometritis)	Uterine Adhesion	Total Incidence Rate
Study Group	15	0 (0.00%)	1 (6.67%)	0 (0.00%)	1 (6.67%)
Control Group	15	1 (6.67%)	5 (33.33%)	4 (26.67%)	10 (66.67%)
χ^2	-	-	-	-	11.6268
P	-	-	-	-	0.0006

2.4 Treatment effect:

The relevant comparative data are shown in Table 4, indicating that the treatment effect between the two groups is significantly different, and the research group is higher than the control group (P<0.05).

Table 4: Comparison of Treatment Efficacy Between Two Groups

Group	Number of Cases	SD (Stable Disease)	PR (Partial Response)	CR (Complete Response)	PD (Progressive Disease)	Total Effective Rate

Group	Number of Cases	SD (Stable Disease)	PR (Partial Response)	CR (Complete Response)	PD (Progressive Disease)	Total Effective Rate
Study Group	15	7 (46.67%)	5 (33.33%)	3 (20.00%)	0 (0.00%)	15 (100.00%)
Control Group	15	5 (33.33%)	3 (20.00%)	3 (20.00%)	4 (26.67%)	11 (73.33%)
X^2	-	-	-	-	-	
P	-	-	-	-	-	

3. Discussion

Endometrial hyperplasia commonly presents with atypical or complex hyperplasia and is considered a precancerous lesion for endometrial carcinoma, characterized by irregular proliferation of endometrial glands. Most cases are reversible and can resolve spontaneously with menstrual shedding; however, some may progress to carcinoma if left untreated. Proper treatment selection and evaluation based on histological diagnosis are crucial for effective management.

Currently, oral progestins are the main treatment method for endometrial diseases in clinical practice, particularly in China, where they are widely applied with notable efficacy. However, their implementation has limitations, particularly for patients who are obese, have a history of thromboembolism, or liver and kidney dysfunction. Recent studies indicate that the LNG-IUS is a novel intrauterine hormonal contraceptive system with greater adaptability in treatment and unique mechanisms of action. Clinical research has shown significant advantages and effectiveness of combining hysteroscopy with the LNG-IUS for treating abnormal endometrial hyperplasia, enhancing patient compliance and acceptance of treatment without the need for daily medication. Compared to surgical treatments, this approach can reduce the necessity for hysterectomy, alleviate dysmenorrhea, and significantly decrease menstrual flow while achieving therapeutic goals without uterine removal. Additionally, some studies suggest that the LNG-IUS has a positive role in inhibiting the progression of endometrial hyperplasia and anovulatory uterine bleeding to carcinoma. Improvements in androgen levels, low-density lipoprotein cholesterol, and total cholesterol post-treatment indicate that the LNG-IUS can positively impact endometrial thickness and metabolic status, contributing to effective disease management.

The Canadian Society of Obstetrics and Gynecology published guidelines on endometrial hyperplasia management in November 2019, reviewing evidence from 2000 to April 2018 and offering recommendations. Guidelines suggest follow-up for infertility patients at 3-month intervals until two consecutive negative endometrial biopsies are achieved, and specific measures for preserving fertility post-treatment are provided. Proper diagnosis and monitoring of endometrial conditions necessitate long-term management, requiring multiple endometrial samples for evaluation and targeted guidance.

Despite the high diagnostic value of hysteroscopic procedures, traditional blind curettage still faces limitations due to its reliance on the clinician's experience and the potential for missed diagnoses. The inaccuracies associated with sampling can adversely affect preoperative and postoperative pathological diagnoses.

This study showed that the study group had higher postoperative pregnancy and endometrial reversal rates, lower total treatment costs, fewer procedures, and a lower incidence of complications, highlighting its efficacy. Hysteroscopy offers high positive predictive value, sensitivity, and specificity, allowing clinicians to analyze

patient conditions more accurately and improve treatment outcomes.

In conclusion, early intervention in endometrial lesions is beneficial, and the combination of LNG-IUS and hysteroscopic endometrial biopsy provides effective treatment, significantly improving endometrial reversal rates and patient satisfaction. Further studies with larger sample sizes and longer follow-up periods are warranted for a comprehensive evaluation.

Conflict of Interest

None.

Acknowledgments

None.

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