

Dysfunction of the Clinical Effect of Levonorgestrel Treatment of Dysfunctional Uterine Bleeding

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ABSTRACT Objective: Study clinical curative effect of levonorgestrel treatment on perimenopausal dysfunctional uterine bleeding. **Method:** Selected 126 outpatient of dysfunctional uterine bleeding which hospitalize from December 2010 to December 2012 at department of gynaecology to undergo levonorgestrel treatment on the 5–7 days of menstruation. The endometrial thickness, hemoglobin, and the PBAC score of before 3, 6 and 12 months after placement were observed and recorded. To observation the adverse reactions after levonorgestrel treatment. **Results:** After treatment, the thickness of the endometrium, the amount of menstruation and the hemoglobin concentration increased in 126 patients. During the treatment, 21 patients experienced mild dizziness and nausea, but did not affect the drug use and efficacy. **Conclusion:** Effects of levonorgestrel on intrauterine treatment of perimenopausal dysfunctional uterine bleeding can effectively reduce the amount of menstruation and increase hemoglobin levels. It is economic, simple, less adverse reaction, and widely entrenched in clinical practice.

KEYWORDS

Levonorgestrel
Uterine bleeding
Perimenopausal

1. Introduction

Dysfunctional uterine bleeding is caused by abnormal uterine bleeding caused by the hypothalamic pituitary ovarian dysfunction. It is a common reproductive endocrine disease, non-organic pathologic mutation, complex pathogenesis, with 10% incidence rate. Previously patients were treated by artificial synthesis of progesterone treatment method which resulted invalid or repeatedly symptoms, and ultimately choose the treatment of hysterectomy. Foreign research data show that levonorgestrel (trade name: Mirena) treatment of perimenopausal dysfunctional uterine bleeding effect is remarkable, therefore, in this study selected 126 outpatient of dysfunctional uterine bleeding which hospitalize from December 2010 to December 2012 at department of gynaecology was placed on

levonorgestrel treatment to analyze and evaluate the safety and clinical efficacy.

2. Materials and methods

2.1. General information

Select 126 cases of dysfunctional uterine bleeding patients treated in our hospital from December 2010 to December 2012. The patients were treated as the research object, and the clinical data of the patients were analyzed with the approval of the ethics committee and informed consent of the patients. Subjects aged 28–54 years old, with average (45.3 ± 7.4) years old, and bleeding time was 21 d to 4 months, which average bleeding time was (65 ± 1.6) d. 126 patients was excluded from levonorgestrel allergic, cervical atypical hyperplasia or cervical cancer, serious heart, liver and kidney disease. There was no statistical difference in the clinical data of all patients ($p > 0.05$).

2.2. Treatment method

Ultrasonography were used to understand condition such as uterine size, sub endometrial thickness, endometrial blood supply. Besides, according to the treatment of the clinical manifestations, diagnostic curettage or hysteroscopy, levonorgestrel was placed on 5–7 days of menses. The

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endometrial thickness, PBAC score, and hemoglobin level were detected before and 3, 6, 12 months after placement. Observation was did on patients with adverse reactions after levonorgestrel [1].

2.3. Curative effect judgment

According to the “Practice of Clinical Medicine Development” the efficacy criteria included: (1) Excellent: Absent of adverse reaction after levonorgestrel treatment and absent of dysfunctional uterine bleeding clinical symptoms; (2) Effective: Absent of adverse reaction after levonorgestrel treatment and clinical symptoms of dysfunctional uterine bleeding diminish; (3) Invalid: Slightly adverse effect occur after levonorgestrel treatment and improve or worsen of dysfunctional uterine hemorrhage clinical symptoms.

$$\text{Total effective} = (1) / [(1) + (2) + (3)] * 100\%.$$

2.4. Statistical methods

All the data in this study were processed by SPSS 17.0 statistical software. The data were measured by means of ($\bar{x} \pm s$) and calculative data analyzed by *t* test, and the data were determined by (χ^2). *p* < 0.05 means the statistical difference between two groups of data compared.

3. Results

3.1. Menstrual quantity changes

Changes of menstrual discharge: follow-up after 3 months use of levonorgestrel, all menstrual volume significantly reduced, there are 30 cases (23.8%) showed irregular vaginal bleeding and during 6 months follow-up, 18 cases (14.3%) of irregular bleeding which was significantly reduced, 5 cases of amenorrhea; amenorrhea after 12 months increased to 9 cases (14.3%), the specific amount of menstrual Pictorial Blood Loss Assessment (PBAC) score see Table 1. If amenorrhea patients should stop PBAC score immediately [2].

Table 1. The amount of PBAC score before and after placement.

| Follow up time | Cases (n) | PBAC score |
|----------------|-----------|--------------|
| Before placing | 126 | 130.5 ± 45.6 |
| In 3 months | 126 | 58.6 ± 17.8 |
| 6 months | 121 | 42.3 ± 10.5 |
| 12 months | 117 | 26.4 ± 6.5 |

3.2. Hemoglobin level and endometrial thickness

Hemoglobin levels and endometrial thickness changes: Administration of levonorgestrel after 6 months, all patients hemoglobin concentration increased and endometrial thickness decreased, while after 12 months, hemoglobin levels returned to normal; the results of endometrial thickness and hemoglobin levels before and after treatment are shown in Table 2.

Table 2. Hemoglobin level and endometrial thickness before and after placement.

| Follow up time | Cases (n) | Hemoglobin level (g/L) | Endometrial thickness (mm) |
|----------------|-----------|------------------------|----------------------------|
| Before placing | 126 | 85 ± 13 | 12.5 ± 5.2 |
| In 3 months | 126 | 97 ± 12 | 8.3 ± 2.8 |
| 6 months | 121 | 116 ± 10 | 6.0 ± 2.2 |
| 12 months | 117 | 116 ± 11 | 5.2 ± 1.0 |

Note: Hb level *p* = 0.005 < 0.05, endometrial thickness *p* = 0.01 < 0.05, the difference was statistically significant.

3.3. Adverse reactions

Adverse reactions: patients suffer with interval headache 1 cases, the proportion was 0.79%, 2 cases of nausea, the proportion was 1.59%, 12 cases of mild headache, the proportion was 9.52%, 20 cases of slight nausea, the proportion was 15.83%. Compared with the general and does not affect the use of medicine and efficacy. Specific results are shown in Table 3.

Table 3. The total effective rate of treatment was [n (%)].

| Group | Cases | Headache | Nausea | Mild headache | Mild nausea |
|-------------------|-------|----------|----------|---------------|-------------|
| Observation group | 126 | 1 (0.79) | 2 (1.59) | 12 (9.52) | 20 (15.87) |

3.4. Treatment efficiency analysis

The excellent treatment was 89, the effective rate was 70.63%, the effective was 31, the effective rate was 24.61%, 6 cases were invalid, the ineffective rate was 4.76%, and the total effective rate was 95.24%. Specific results are shown in Table 4.

Table 4. The total effective rate of treatment was [n (%)].

| Group | Cases | Excellence | Effective | Invalid | Total effective |
|-------------------|-------|------------|------------|----------|-----------------|
| Observation group | 126 | 89 (70.63) | 31 (24.61) | 6 (3.33) | 120 (95.24) |

4. Discussion

Dysfunctional uterine bleeding is caused by the hypothalamic-pituitary-ovarian dysfunction. It is a common endocrine reproductive disease, but there is no organic disease in the whole body included internal and external genital organs. It has been reported that the incidence of functional bleeding in patients with uterine bleeding accounted for 20–40%, which became a serious threat to the majority of women’s physical and mental health [3–5]. Traditional progesterone treatment was long which took 3–6 months, partial patient experience invalid treatment or recurrence after discontinuation of treatment, and even persistent or recurring abnormal uterine bleeding and become obstinate dysfunctional uterine bleeding. Hysterectomy had the curative effect in the treatment of obstinate dysfunctional

uterine bleeding, but it cause permeant effect in patients with ovarian function and early menopausal symptoms. Most patients' psychological unacceptable, especially young women. Therefore, it is necessary to seek a safe, simple and effective alternative treatment method.

Levonorgestrel is 1 times more potent than norgestrel which commonly used in clinical to treat irregular menstruation cycle, endometrial endometriosis, dysfunctional uterine bleeding and used as an emergency contraceptive. In recent years clinicians begin to apply it for the dysfunctional uterine bleeding treatment, as the mechanism of action was targeting hypothalamus and pituitary, which make the peak of follicle-stimulating hormone and luteinizing hormone reduced, inhibit ovulation, effects on the endometrium become low column shape changes in a state of atrophy, and to achieve hemostasis purposes [6]. Mechanism of levonorgestrel and oral progestin for perimenopausal dysfunctional uterine bleeding treatment are basically the same, but the former produce local action in the uterus. Levonorgestrel rapidly absorbed by capillary network of endometrial basal layer into the blood circulation, concentration of local endometrial 1000 times more higher than that in peripheral blood circulation, hence possess an advantages in occupying the local progesterone receptors, and further inhibit the synthesis of estrogen receptor, therefore administration of levonorgestrel reduce the menstrual discharge, and even amenorrhea. And the use of levonorgestrel after 6 months all patients' hemoglobin concentration increased, endometrial thickness decreased, after 12 months of hemoglobin levels were restored to normal.

68.0% of the patients on levonorgestrel shown rapid hemostasis within 6 h, 32.0% of patients' hemostasis within 24-48 hours. After 6 months follow-up, irregular bleeding was significantly reduced, which dropped to 18 cases (14.3%), and 108 patients returned to normal, the effective rate was 85.7%. After 3 months of treatment, there were 96 patients return normal, with 76.1% efficiency. After 6 months of treatment, there were 5 cases of amenorrhea; however, during 12 months of follow-up, amenorrhea increased to 9 cases (14.3%). The study showed that the drug having rapid hemostasis effect, with high therapeutic effect and cause recovery of menstruation in good condition, especially obvious in short-term effect. On the observation of adverse reactions in the patients of levonorgestrel treat-

ment, there was 1 case of headache (0.79%), 2 cases nausea (1.59%), 12 cases of slight headache (9.52%), and 20 cases of mild nausea (15.83%). Therefore, it is shown that the administration of levonorgestrel cause adverse reactions such as headache and nausea in patients, but the adverse reaction was not obvious, and the adverse reactions affecting small population of patients, and does not affect the whole treatment period [7].

As the conclusion, levonorgestrel treatment for perimenopausal dysfunctional uterine bleeding can effectively reduce the amount of menstruation discharge, increase hemoglobin levels, and it is economic, simple, less adverse reaction, with significantly short-term efficacy.

Conflicts of interest

These authors have no conflicts of interest to declare.

Authors' contributions

These authors contributed equally to this work.

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