

Analysis of the Clinical Effect of Multi-Drug Combination Therapy on Patients with Gynecological Inflammation

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Abstract: *Objective:* To investigate the effect of multi-drug combination therapy for patients diagnosed with gynecological inflammation. *Methods:* A total of 100 patients diagnosed with gynecological inflammation between August 2023 and January 2024 were selected as the study subjects. The patients were separated into a control group and an observation group, with 50 patients in each group. The control group underwent conventional drug therapy while the observation group combined lactobacillus vaginal capsule treatment. The clinical effects of the treatments were compared. *Results:* The total efficacy of the treatment received in the observation was higher. The time taken for gynecological symptom relief was shorter, and the values of vaginal pH, interleukin-6 (IL-6), and C-reactive protein (CRP) were lower after treatment ($P < 0.05$) compared to the control group. *Conclusion:* The multi-drug combination therapy can achieve rapid symptomatic relief and improve the vaginal microenvironment in patients with gynecological inflammation, which can reduce their inflammatory response and improve their prognosis.

Keywords: Gynecological inflammation; Multi-drug combination therapy; Clinical effect; Vaginal pH; Inflammatory response

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1. Introduction

Gynecological inflammation refers to inflammatory diseases that occur in the female reproductive system like the internal organs (e.g., uterus, ovaries, fallopian tubes), external organs (e.g., vagina, vulva), or their surrounding tissues. Common gynecologic inflammatory diseases include vaginitis, cervicitis, and pelvic inflammatory disease ^[1], which are caused by bacterial, fungal, or viral infections. Women suffering from gynecological inflammation may experience symptoms such as irregular vaginal discharge, pain, burning sensation, and frequent urination. Gynecological inflammation is primarily treated using antibiotics, antifungal drugs, and other medications ^[2]. The pathogenesis of gynecological inflammation is complex and may be caused by a variety of factors such as bacterial infection, fungal infection, viral infection, etc. One medication alone cannot address all the causes of the disease, which leads to poor patient outcomes. Furthermore, since each

patient's condition varies, a singular drug cannot cater to personalized treatment needs, making it challenging to effectively manage uncomfortable symptoms such as vaginal pain, itching, and abnormal secretions [3]. Implementing timely and standardized combined therapy for gynecological inflammation can significantly alleviate patient symptoms, effectively prevent complications, deterioration, and recurrence; enhance cure rates, and safeguard reproductive health. This study aims to assess the impact of actively administering multi-drug combination therapy in patients with gynecological inflammation.

2. Information and methods

2.1. General information

A total of 100 patients diagnosed with gynecological inflammation between August 2023 and January 2024 were selected as the study subjects. Inclusion criteria: (1) confirmed by gynecological examination, (2) no history of antibiotic treatment 30d before enrollment, (3) signed an informed consent to the study. Exclusion criteria: (1) allergy to therapeutic drugs, (2) serious organic lesions or infectious diseases, (3) mental disorders. The patients were separated into a control group and an observation group, with 50 patients in each group. The mean age of the control group was 42.88 ± 10.27 years (ranging from 26 to 68 years), while the experimental group had a mean age of 42.13 ± 10.18 years (ranging from 27 to 65 years). There was no statistical significance in the general data of the two groups ($P > 0.05$).

2.2. Methods

The control group was treated with conventional medication based on their condition.

- (1) Trichomonas vaginitis: Administration of 2 g metronidazole tablets
- (2) Bacterial vaginosis: Compound metronidazole vaginal suppositories (3 g/capsule) were prescribed. The patients were instructed to insert the capsule into the vagina in a squatting position every night after washing the vulva, 1 capsule/day.
- (3) Vulvovaginal candidiasis: Outer genitalia vaginal pseudomycosis vaginal insertion of 0.15g clotrimazole vaginal suppository
- (4) Chronic pelvic inflammatory disease: 0.4 g metronidazole tablets, 3 times/d.

The patients in the observation group were given lactobacillus vaginal capsule treatment regardless of the type of vaginitis. The patients were instructed to insert the capsule into the vagina after washing the vulva, 1 capsule (0.5g)/d.

All patients were instructed to pay attention to hand hygiene, change their underwear regularly, and refrain from sexual intercourse. All treatment lasted for 7 days.

2.3. Observation index

2.3.1. Clinical efficacy

- (1) Very effective: the disappearance of symptoms, vaginal cleanliness – Degree I–II
- (2) Effective: Improvement in clinical symptoms, vaginal cleanliness – Degree III–IV (3) Ineffective: no improvement in the above indicators [4].

Total efficacy = Very effective + Effective

2.3.2. Symptom relief

The indicators for symptom relief include the relief of abnormal vaginal secretions, itching, and burning sensation.

2.3.3. Relevant indicators

Vaginal secretions were collected as a means of detecting vaginal pH, with 3.8–4.4 as the normal range. Detection of interleukin-6 (IL-6) was performed according to the operation standard of enzyme-linked immunosorbent assay. The detection of C-reactive protein (CRP) was performed according to the operating standard of turbidimetric immunoassay.

2.4. Statistical analysis

The data were analyzed using SPSS 27.0. The measurement data were expressed as mean \pm standard deviation and were analyzed using a t-test. The count data were expressed as percentages (%) and analyzed by a χ^2 -test. $P < 0.05$ indicated that the difference was significant.

3. Results

3.1. Clinical efficacy

The total efficacy of the observation group was significantly higher than that of the control group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of clinical efficacy between the two groups [n (%)]

Groups	n	Very effective	Effective	Ineffective	Overall efficacy
Observation group	50	32 (64.00)	15 (30.00)	3 (6.00)	47 (94.00)
Control group	50	28 (56.00)	12 (24.00)	10 (20.00)	40 (80.00)
χ^2	-	-	-	-	4.332
P	-	-	-	-	0.037

3.2. Time taken for gynecological symptom relief

The time taken for symptom relief of the observation group was significantly shorter than that of the control group ($P < 0.05$), as shown in **Table 2**.

Table 2 Comparison of gynecological symptom relief time between the two groups (mean \pm standard deviation, d)

Groups	n	Abnormal vaginal discharge	Vaginal itch	Burning sensation in the vagina
Observation group	50	1.98 \pm 0.13	2.55 \pm 0.32	1.81 \pm 0.42
Control group	50	3.48 \pm 0.06	4.08 \pm 0.25	2.25 \pm 0.72
t	-	74.079	26.641	3.732
P	-	0.000	0.000	0.000

3.3. Vaginal pH, IL-6, and CRP levels

The vaginal pH, IL-6, and CRP of the observation group were all lower than those of the control group ($P < 0.05$) as shown in **Table 3**.

Table 3 Comparison of vaginal pH, IL-6, and CRP levels between the two groups (mean ± standard deviation)

Groups	n	Vaginal pH		IL-6 (ng·mL ⁻¹)		CRP (mg/mL)	
		Pre-treatment	Post-treatment	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Observation group	50	5.72 ± 0.34	4.08 ± 0.06	125.88 ± 4.75	74.32 ± 3.68	21.22 ± 3.35	6.21 ± 1.75
Control group	50	5.74 ± 0.36	4.42 ± 0.11	125.79 ± 4.72	95.42 ± 2.76	21.27 ± 3.38	11.24 ± 2.03
<i>t</i>	-	0.286	19.187	0.095	32.435	0.074	13.271
<i>P</i>	-	0.776	0.000	0.925	0.000	0.941	0.000

4. Discussion

Gynecological inflammation tends to have a lengthy treatment process and a high likelihood of recurring. Utilizing a combination of drugs can improve the efficacy, shorten treatment time, and reduce symptoms and recurrence rates. However, it is necessary to select the appropriate drug combination and dosage according to the patient's condition, strictly follow the medical prescription, and avoid drug interactions and adverse reactions. This approach ensures effective inflammation control and minimizes complications [5].

Metronidazole is a synthetic antimicrobial drug that exhibits potent efficacy against protozoa, bacteria, and anaerobes. In treating gynecological inflammation, it permeates cell membranes, disrupting nucleic acid synthesis, thus eliminating bacteria and protozoa and effectively curbing infection spread and recurrence [6]. Moreover, metronidazole inhibits leukocyte chemotaxis, adhesion, and release of inflammatory mediators, thereby reducing tissue inflammation and relieving symptoms. In summary, metronidazole effectively treats gynecological inflammation, alleviating symptoms and promoting recovery through antibacterial, anti-inflammatory, and antioxidant mechanisms [7]. Compound metronidazole suppositories exhibit antibacterial properties by inhibiting pathogenic microorganism growth, thus reducing inflammatory lesion infections. Besides its effectiveness against bacteria and protozoa, metronidazole also demonstrates antimicrobial activity against certain fungi, making it applicable for treating gynecological inflammation caused by fungal infection. Metronidazole also exhibits anti-inflammatory properties, which aid symptom relief and healing. Clotrimazole is a broad-spectrum antifungal drug that functions by inhibiting fungal cell wall synthesis and metabolic activity, thereby stopping fungal growth and reproduction. Vaginal clotrimazole can effectively combat inflammation caused by fungal infection. They possess anti-inflammatory properties, which reduce inflammation, alleviate symptoms, and facilitate recovery and healing. Moreover, when applied locally, these suppositories promote sustained release and absorption of the drug in the affected area, thereby enhancing its efficacy [8].

In this study, the total efficacy of the observation group was higher than that of the control group ($P < 0.05$). This suggests that combination of lactobacillus vaginal capsules and lactobacillus vaginal capsules is more effective in treating gynecological inflammation compared to conventional treatment. Lactobacillus vaginal capsule is a kind of probiotic bacteria that aids in regulating vaginal pH and maintaining a healthy microecological balance by producing lactic acid and other beneficial metabolites. This balance helps inhibit the growth and reproduction of harmful bacteria and reduces the risk of inflammation. Lactobacillus vaginal capsule can produce antimicrobial substances, such as lactic acid and hydrogen peroxide, which antagonize pathogenic bacteria and effectively inhibit their proliferation, thereby reducing inflammatory symptoms. Additionally, lactobacilli stimulate the immune system, enhance immune function, and facilitate tissue repair, accelerating the healing process and reducing inflammation duration and severity. Administering the drug vaginally directly targets the vagina, avoiding interference with gastrointestinal function and enhancing drug

concentration for restoring microecological balance and symptom relief ^[9]. Lactobacillus vaginal capsules possess antibacterial and anti-inflammatory properties, directly targeting pathogenic microorganisms causing gynecological inflammation to alleviate symptoms. These ingredients also clear heat and toxins, reducing fever, redness, and swelling associated with inflammation. Furthermore, they promote local blood circulation, regulate immune function, facilitate metabolic product discharge, and accelerate tissue repair, enhancing resistance and expediting recovery ^[10]. This study shows that the time taken for symptom relief in the observation group was shorter than that of the control group ($P < 0.05$). The combined use of multiple drugs offers comprehensive treatment for various causes and symptoms of gynecological inflammation, resulting in personalized treatment and improved effectiveness. This approach inhibits inflammatory responses at multiple levels, expedites inflammation subsidence, effectively controls inflammation development, shortens treatment duration, and reduces patient discomfort. Additionally, the combined drug therapy comprehensively removes pathogens, decreasing recurrence risk and enhancing treatment durability and effectiveness. Moreover, the observation group exhibited lower vaginal pH, IL-6, and CRP levels ($P < 0.05$). This indicates that lactobacillus vaginal capsules significantly normalize vaginal pH and improve the vaginal microecological environment in gynecological inflammation patients. It's believed that lactobacillus inhibits pathogen growth by regulating vaginal flora, maintaining bacterial balance, and suppressing inflammatory reactions, thus enhancing efficacy in adjuvant therapy.

5. Conclusion

The multi-drug combination therapy is effective in relieving the symptoms and improving the vaginal microenvironment of gynecological inflammation patients. It enhances the therapeutic effect, reduces inflammatory responses, and improves prognosis.

Disclosure statement

The author declares no conflict of interest.

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