

# Types and Clinical Application of External Dosage Forms for Gynecological Inflammation

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**Abstract:** Gynecological inflammation is more common in women's life, and an occur in all age groups [1]. Clinically, Western medicine is mainly anti-infective, bacteriostatic and antiviral. Traditional Chinese medicine believes that gynecological inflammation is mostly caused by lower coke dampness-heat, and the treatment is based on the principle of heat-clearing, detoxification and dampness. At present, the external dosage forms of traditional Chinese and western medicine in the treatment of gynecological inflammation mainly include suppositories, lotions, Yin plug tablets, ointments, capsules and gels. This article reviews the clinical application of external dosage forms of traditional Chinese and western medicine for gynecological inflammation in recent years, in order to provide some reference for the selection and clinical application of external dosage forms of gynecological inflammation. Gynecological inflammation is more common in clinic. According to statistics, 75% of women suffer from gynecological inflammation in their daily life, and about 500 to 1 0 women in China suffer from vaginitis every year. The incidence of vaginal inflammation in married women of childbearing age in China is 42.1%. Gynecological inflammation includes acute inflammation and chronic inflammation, mainly vaginitis, cervicitis and pelvic inflammation. Clinical manifestations: abnormal leucorrhea, vulvar itching pain, sexual discomfort, lower abdominal and lumbosacral pain; gynecological examination showed vulva redness and swelling, increased vaginal secretions, cervical congestion, uterine tenderness, fullness of posterior fornix and so on. If inflammation is treated in time, it can recover as soon as possible; if it is not treated in time, it can cause recurrent inflammation and may cause other diseases [2]. At present, the commonly used external preparations of traditional Chinese and western medicine in clinical gynecological inflammation are suppositories, lotions, Yin plug tablets, ointments, capsules and gels [3][4]. This article briefly reviews the dosage forms and types of traditional Chinese and western medicine commonly used for external use of gynecological inflammation in recent years, in order to provide some guidance for the selection of clinical drugs for gynecological inflammation.

**Keywords:** Gynecological Inflammation, Traditional Chinese and Western Medicine, External Dosage Form, Clinical Application

## 1. Suppository

Suppository is a kind of solid preparation which is composed of drugs and matrix. It dissolves and spreads rapidly through mucosal epithelial cells in the cavity, and gradually releases the drug to produce curative effect. The suppository absorbs the drug through the vagina and rectum, the local concentration is higher, the action time is longer, and the effect can be released slowly, the curative effect is significant, and the first-pass effect of the liver can be avoided. Traditional Chinese medicine suppositories have a long history of application. As early as in the synopsis of the Golden Chamber, Cnidium seed Powder was made into suppositories and placed in the vagina to treat gynecological inflammation caused by damp-heat syndrome[5]. Vaginal suppository and anal suppository are commonly used in the treatment of gynecological inflammation, and traditional Chinese and western medicine suppositories are common in clinic, such as recombinant human interferon  $\alpha$  2a suppository, nitrofurural nystatin vaginal suppository, compound metronidazole suppository, compound zedoary turmeric oil suppository, Baofukang suppository, compound seabuckthorn seed oil suppository and so on.

### **1.1 Recombinant Human Interferon Alpha 2a Suppository**

Main ingredient: recombinant human interferon  $\alpha$  2a. It can treat chronic cervicitis and cervical erosion caused by vaginal viral infection, prevent high-risk cervical HPV infection and improve the negative conversion rate [6].

### **1.2 Dakonine Suppository (Miconazole Nitrate Vaginal Suppository)**

Each tablet contains 0.4 grams of miconazole nitrate, which can be used to treat candidal vulvovaginitis and bacterial vaginosis, and can significantly restore the vaginal environment of patients [7].

### **1.3 Compound Zedoary Turmeric Oil Suppository**

This product is a compound preparation, each tablet contains 0.21 ml of zedoary turmeric oil and 50 mg of econazole nitrate. It is effective in the treatment of candidal vulvovaginitis, trichomonal vaginitis and chronic cervicitis[8][9].

### **1.4 Nitrofurazone Nystatin Vaginal Suppository (McCampa)**

The main ingredients of this product are nitrofurazone and nystatin. It mainly treats vulva, vaginal infection and vaginal mixed bacterial infection caused by bacteria, trichomonas and Candida. It also plays a good role in regulating Lactobacillus in vagina and helps to maintain vaginal microcirculation [10].

### **1.5 Compound Metronidazole Suppositories**

This product is a compound preparation, each tablet contains metronidazole 0.5g, ginseng stem and leaf saponins 0.025 grams, vitamin E 0.04g. It is mainly used in the clinical treatment of trichomonal vaginitis and bacterial vaginosis, which can not only effectively inhibit bacteria, but also improve immune function, thus reducing the probability of reinfection [11].

### **1.6 Tinidazole Suppository**

This product contains tinidazole 0.2g per tablet. It is mainly used for the treatment of trichomonal vaginitis and bacterial vaginosis, which can improve the cure rate and reduce the recurrence rate [12].

### **1.7 Compound Seabuckthorn Seed Oil Suppository**

It is composed of seabuckthorn seed oil, Cnidium seed, frankincense, myrrh, Sophora flavescens, calamine and borneol. It can clear heat, dryness and dampness, relieve swelling and pain, kill insects and stop itching, activate blood circulation and promote muscle. It can be used for cervical erosion caused by damp-heat injection, and the curative effect is significant [13].

### **1.8 Baofukang Suppository**

The main ingredients are zedoary turmeric oil and borneol. It is feasible to break blood stasis, invigorate muscle and relieve pain. For the treatment of fungal vaginitis, senile vaginitis and cervical erosion, it can not only shorten the negative time of bacteria, effectively reduce the level of inflammatory factors, but also significantly improve immunity [14].

## **2. Lotion**

Western medicine lotion generally refers to the medical liquid of one or more insoluble substances. Traditional Chinese medicine lotion refers to the liquid preparation made from prepared pieces of traditional Chinese medicine by processing method, which can be used for skin and cavity smearing or cleaning, and has the effect of cleaning and disinfection, killing insects and relieving itching. The lotion is convenient and fast, and it can clean the affected area quickly, but it is inconvenient to carry and use outside. The commonly used gynecological lotions are povidone iodine solution, compound Sophora

flavescens lotion, Jieryin lotion, red nuclear Fujie lotion, compound Phellodendron Phellodendri liquid and so on.

### **2.1 Red Nucleus Fujie Lotion**

The main component is Hawthorn kernel dry distillate. It can detoxify and remove dampness, kill insects and stop itching. Used for fungal vaginitis and non-specific vaginitis, can significantly improve vaginal microecology and clinical TCM syndrome, high safety, and no adverse reactions occurred [15].

### **2.2 Jieryin Lotion**

It is composed of Fructus Cnidii, Artemisia argyi, Radix Atractylodis, Atractylodes, peppermint, Cortex Phellodendri, Scutellaria baicalensis, Sophora flavescens, Fructus Scutellariae, Herba Artemisia, Fructus Gardeniae and Honeysuckle. Can clear heat, dryness and dampness, kill insects and stop itching. It is suitable for fungal, trichomonal and non-specific vaginitis, and its strong ability to remove pathogens can improve patients' uncomfortable symptoms and reduce the PH value in the vagina [16].

### **2.3 Ana'er Fu Cleanser**

It is composed of pomegranate peel, bitter bean, snake seed, gallop, coral, pepper and borneol. It can clear heat, dryness and dampness to stop itching. For all kinds of bacterial, fungal, trichomonal vulvitis, vaginitis caused by vaginal itching, redness and swelling, excessive leucorrhea and so on [17].

### **2.4 Compound Huangsong Lotion**

It is composed of gang pine oil, big leaf eucalyptus oil, mountain sesame oil, Cnidium oil, Qianliguang, skin seed and Phellodendron Phellodendri. Can clear heat, dryness and dampness, dispel wind and stop itching. For the treatment of fungal, trichomonal vaginitis and vulvitis with vulvar itching, with a large amount of uncomfortable symptoms, the effective rate is more than 90%, and there is no irritation to skin and mucosa [18].

### **2.5 Jieryin Antipruritic Lotion**

This product is composed of Sophora flavescens, Cnidium, Xu Changqing, Poria cocos, Qianliguang, Phellodendron Phellodendri, Polygonum cuspidatum, Radix Paeoniae Rubra, Zanthoxylum bungeanum, Ginseng leaves, licorice and menthol. It can clear heat and detoxify, dispel wind and stop itching. For vaginitis due to damp-heat injection caused by subzonal increase, vulvar pruritus.

### **2.6 Metronidazole Chlorhexidine Lotion**

This product is a compound preparation containing 1.2 mg of chlorhexidine gluconate and 0.2 mg of metronidazole per milliliter. For bacteria, trichomonas, mold caused by a variety of vaginitis, has a strong bacteriostatic and bactericidal effect, and does not inhibit Lactobacillus.

### **2.7 Povidone Iodine Solution**

20ml, 30ml, 50ml, 80ml, 60ml, 100ml, 150ml, 200ml in each bottle. For external use, dip a small amount with a cotton swab and apply it locally from the center to the periphery. Once or twice a day. The main ingredient is povidone iodine and the excipient is polyethylene glycol 200. For the treatment of trichomonal vaginitis, fungal vaginitis [19], suppurative dermatitis, skin fungal infection, etc., short treatment time, quickly improve patients' uncomfortable symptoms, but also effectively prevent the occurrence of cervicitis.

### **2.8 Compound Sophora Flavescens Lotion**

Development, specification: 300ml. Dilute the product with lukewarm water to 30%, 50%, and wash the vulva. Once or twice a day. Seven days is a course of treatment. The main groups are Sophora flavescens, Cortex Phellodendri, Fructus Cnidii, Fructus Brucea, Fructus Brucea, Fructus Corydalis,

Flos Lonicerae, Wild Chrysanthemum, Chrysanthemum, Bark, Atractylodes, Fangfeng, Scutellaria, licorice.

It can clear heat and detoxify, dry and damp and stop itching. It is used to improve women's symptoms such as excessive underwear and vulvar pruritus, the effective rate is high, the vaginal microecology of patients is significantly improved, and the recurrence rate is low [20].

### 3. Topical Tablet

Vaginal tablets act directly on the vagina and are absorbed through the vaginal mucosa, and the action time of the drug in the vagina is prolonged, and the availability of the drug is improved; and the drug is decomposed through vaginal mucus, increasing the action area of the drug. Vaginal tablets have the advantages of quick effect and high curative effect, and are widely used in clinic. Common Yin plug tablets are clotrimazole vaginal tablets, metronidazole vaginal effervescent tablets, Jieeryin effervescent tablets, Fuyanxiao effervescent tablets, metronidazole vaginal effervescent tablets and so on.

#### 3.1 Fuyanxiao Effervescent Tablets

It is composed of Sophora flavescens, Cortex Phellodendri, Fructus Cnidii, Honeysuckle, Wild Chrysanthemum, Fructus Rehmanniae, Angelica dahurica, Acorus calamus, Borneol and Pig Bile Ointment. It can clear heat, dryness and dampness, remove belt and relieve itching. Treatment belongs to Candida vaginitis, trichomonal vaginitis, bacterial vaginitis, vaginal itching, flushing, swelling, with a large amount, its fishy smell, strong bacteriostatic effect, can effectively relieve symptoms, regulate vaginal microorganisms, the recurrence rate is low [21].

#### 3.2 Jieeryin Effervescent Tablets

It is composed of Fructus Cnidii, Artemisia argyi, Radix Atractylodis, Atractylodes, peppermint, Cortex Phellodendri, Scutellaria baicalensis, Sophora flavescens, Fructus Scutellariae, Herba Artemisia, Fructus Gardeniae and Honeysuckle. Can clear heat, dryness and dampness, kill insects and stop itching. Used for the treatment of fungal, trichomonal vaginitis, etc., can improve patients' uncomfortable symptoms in a short time [22].

#### 3.3 Fuyanling Effervescent Tablets

It is composed of purple pearl leaf, camphor, Baibu, fairy crane grass, borneol, Sophora flavescens, alum, Cnidium, benzalkonium bromide and boric acid. Can clear heat, dryness and dampness, kill insects and stop itching. Used in the treatment of fungal and trichomonal vaginitis, can significantly improve the symptoms and signs of patients, and help to reduce the recurrence rate [23].

#### 3.4 Clindamycin Hydrochloride Vaginal Effervescent Tablets

Mainly used for bacterial vaginosis.

#### 3.5 Maiminol-nifetil Vaginal Tablets

Treatment of vulvar and vaginal infections and leucorrhea caused by bacteria, trichomonas, molds and Candida can significantly improve the symptoms of discomfort and reduce the level of inflammatory factors [24].

#### 3.6 Nystatin Vaginal Effervescent Tablets

This product contains 100000 units of nystatin. For candidal vulvovaginitis, high antifungal activity and negative conversion rate [25].

### 4. Ointment

Ointment is a semi-solid topical dosage form made by mixing the raw material drug with the suitable matrix, which is easy to be applied on the skin or mucous membrane.

Ointment mainly plays a local therapeutic role, a few can be absorbed through the skin to produce systemic therapeutic effect, and paste adhesion to the vaginal wall can make the local effect for a long time and enhance the curative effect.

However, there are few kinds of ointment used in clinical gynecological inflammation, which needs further research and development.

#### ***4.1 Povidone Iodine Cream***

This product contains 0.1 grams of povidone iodine per gram. Gynecology for candidal vulvovaginitis, bacterial vaginosis and mixed infectious vaginitis can not only effectively clean and disinfect the vagina, but also promote mucosal repair and reduce the recurrence rate [26].

#### ***4.2 Premarin-conjugated Estrogen Ointment***

The main ingredients of this product are: conjugated estrogen. This product is suitable for the treatment of atrophic vaginitis and vulvar wrinkles, which can not only quickly improve the symptoms of vaginal atrophy, but also reduce the recurrence rate [27].

#### ***4.3 Nitrofurazone Nystatin Vaginal Ointment***

This product is a compound preparation, which consists of 0.5g nitrofurazone and 200000 units of nystatin. It can be used to treat bacterial vaginosis, trichomonal vaginitis, vaginal mixed infection and candidal vaginosis. On the basis of inhibiting bacteria, it can also accelerate the balance of vaginal microecology and reduce the recurrence rate [28].

### **5. Capsule**

Capsule is a solid preparation made by filling the drug in a hollow hard capsule or sealed in an elastic soft capsule. After vaginal tamponade, it dissolves under the action of vaginal secretion and produces a lasting effect. It is widely used in clinic, and the common vaginal soft capsules are miconazole nitrate vaginal soft capsule, nitrofurazone vaginal soft capsule, Lactobacillus live vaginal capsule, Fuyanping capsule, Baidajing capsule, prostrated vaginal capsule and so on.

#### ***5.1 Fuyanping Capsule***

It is composed of *Sophora flavescens*, *Cnidium*, bitter wood, pearl layer powder, borneol, withered alum, menthol, boric acid and so on. Can clear heat and detoxification, dampness and stop belt, kill insects and stop itching. Used for vaginitis and vulvitis caused by trichomonas, molds and bacteria, can effectively improve symptoms, regulate vaginal environment and PH value, and inhibit the reproduction of pathogens [29].

#### ***5.2 Fuyanling Capsule***

It is composed of purple pearl leaf, boric acid, *Sophora flavescens*, camphor, fairy crane grass, alum, Baibu, borneol, snake seed and so on. Can clear heat, dryness and dampness, kill insects and stop itching. For the treatment of fungal, trichomonal, bacterial vaginitis [30].

#### ***5.3 Dingjunsheng-Lactobacillus Live Bacteria Capsule***

The main components are live Lactobacillus. Used in the treatment of bacterial vaginosis caused by flora disorder, it can greatly improve the symptoms of patients, maintain vaginal microecological balance and improve vaginal cleanliness [31].

#### ***5.4 Dakonine-miconazole Nitrate Vaginal Soft Capsule***

The main ingredient is miconazole nitrate. The treatment of double infection caused by candidal vulvovaginitis and gram-positive bacteria can effectively inhibit fungi so as to improve symptoms and reduce recurrence [32].

## 6. Gel.

Gel is a thick liquid or semi-solid preparation of suspension or emulsion made of drugs and auxiliary materials that form gel. The gel can act on the vaginal mucosa for a long time and exert its efficacy. The commonly used gynecological inflammatory gels are *Sophora flavescens* gel, recombinant interferon-2b gel, Shukang gel, Aijit gel, as well as Baofukang gel, Chun milk gel and so on.

### 6.1 *Shukang Gel*

The main ingredient is Hawthorn kernel essence. It can detoxify and remove dampness, kill insects and stop itching. Can be used for fungal vaginitis, trichomonal vaginitis see above syndrome, the effect is obvious, and the recurrence rate is low [33].

### 6.2 *Sophora Flavescens Gel*

The main component is total alkaloids of *Sophora flavescens*. It has antibacterial and anti-inflammatory effect. For gynecological chronic inflammation such as cervical erosion, trichomonal vaginitis and vaginal fungal infection, the effective rate is as high as 95% [34].

### 6.3 *Metronidazole Vaginal Gel*

The main component is metronidazole. Used in the treatment of bacterial vaginosis, the curative effect is remarkable [35].

### 6.4 *Chitosan Gynecological gel*

This product is a gel made of chitosan, glycerin and purified water. It has the effect of repairing and regenerating and promoting ulcer healing. This product is used in the adjuvant treatment of bacterial vaginitis, candidal vaginitis and uterine erosion, which can effectively promote wound healing and improve the increase of vaginal secretion [36].

### 6.5 *Youjingan-recombinant Human Interferon a 2b Gel*

This product can treat cervical erosion, improve the state of oxidative stress and reduce inflammation, which is beneficial to wound healing [37].

## 7. Spray

Spray refers to a preparation that does not contain an ejector and sprays the liquid into a fog with the help of the pressure of a manual pump.

The spray can accelerate drug absorption, is easy to carry, and has a long storage time.

The common spray is Jiekangning spray Fufukang spray.

### 7.1 *Jiekangning Spray*

It is composed of *Phellodendron Phellodendri*, *Coptis chinensis*, *Cnidium* seed, Coix seed, *Poria cocos* and pepper. Can clear heat and detoxification, dry dampness insecticidal, anti-itching and detumescence. Mainly used for fungal, trichomonal vaginitis, vulvitis and vulvar eczema, pruritus.

### 7.2 *Fufukang Spray*

It consists of a monk's bed and thousands of miles. It can clear heat and detoxify, activate blood circulation and relieve pain, kill insects and relieve itching. For trichomonal vaginitis [39], fungal vaginitis [40], bacterial vaginosis, vulvitis [41], convenient application, short treatment time, no obvious adverse reactions [38].

## 8. Other Dosage Forms

In addition to the common dosage forms, some emerging dosage forms are also gradually being used in clinical practice.

### 8.1 Baofukang Foam

The main ingredients are zedoary turmeric oil and borneol. It is feasible to break blood stasis, invigorate muscle and relieve pain. It can be used for the treatment of fungal vagina and cervical erosion with remarkable effect and convenient use [42].

### 8.2 Boxingkang Medicine Film

It is composed of *Sophora flavescens*, Southwest *Scutellaria baicalensis*, *Trichosanthes*, *Cnidium*, Willow Branch, Rhubarb, Willow, *Gardenia jasminoides*, Yincheng and Dandelion. It can clear heat and detoxification, dry dampness and kill insects, dispel wind and stop itching. Used for the treatment of trichomonal vaginitis, fungal vaginitis, acute and chronic cervicitis and cervical erosion, with the advantages of short treatment time, quick repair and less bleeding [43].

### 8.3 Cell Wall Skeleton Preparation of *Nocardia Rubrum*

Arabinogalactan, cell wall acid and mucopeptide make up the cell wall skeleton of *Nocardia rubra*. It can be used to treat cervical erosion, improve the negative conversion rate of high-risk HPV infection and regulate immune function [44].

With the continuous increase of gynecological inflammation, the use of traditional Chinese and western medicine has attracted more and more attention. Because of the shortcomings of internal medicine in the treatment process, such as great side effects, easy recurrence and drug resistance, topical preparations are more and more widely used in clinic. This paper reviews the commonly used drugs in common dosage forms in order to provide reference for the selection of clinical drugs for gynecological inflammation.

Of course, how to better improve the traditional dosage forms and develop new dosage forms for clinical application is an urgent problem to be solved in the realization of gynecological inflammation.

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