Review Article

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# Enhanced Efficacy of Dane Fukang Decoction in Comparison to Conventional Treatments for Endometriosis

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## Abstract

Endometriosis is a chronic gynecological disorder affecting millions of women worldwide, characterized by the growth of endometrial-like tissue outside the uterus. Conventional treatments, including hormonal therapies and surgery, often have limitations and side effects. This review explores the therapeutic potential of Dane Fukang decoction, a traditional Chinese herbal formula, in managing endometriosis. By examining this herbal remedy's pharmacological mechanisms, clinical evidence, and safety profile, we aim to provide a comprehensive understanding of its role in endometriosis treatment.

The review discusses the multi-targeted actions of key herbs in Dane Fukang decoction, such as Radix Astragalus and Radix Angelicae Sinensis, which possess anti-inflammatory, anti-angiogenic, and immunomodulatory properties relevant to the pathophysiology of endometriosis. The clinical efficacy of Dane Fukang decoction in alleviating endometriosis symptoms, as demonstrated by higher total effective rates and fewer adverse reactions compared to conventional medications like gestrinone, is also highlighted.

**Keywords:** Endometriosis, Dane fukang decoction, Gestrinone, Chinese medicine

**What was Known**

- The research supports the therapeutic effectiveness of Dane Fukang in treating endometriosis

**What's New and Next**

- Future studies could compare the efficacy of Dane Fukang to other endometriosis treatments

## Introduction

Endometriosis affects approximately 10–15% of women of reproductive age worldwide[1,3], with prevalence rates as high as 35–50% among women with chronic pelvic pain and infertility.[4, 5] Severe dysmenorrhea, chronic pelvic pain, dyspareunia, and infertility are all common symptoms of endometriosis, which is characterized by the presence of endometrial-like tissue outside the uterus.[6] Theories suggest that retrograde menstruation, coelomic metaplasia, stem cells, and immune dysfunction all contribute to the development and progression of endometriosis. Multiple theories have been proposed to explain the pathogenesis of endometriosis. The most widely accepted theory is retrograde menstruation, first proposed by Sampson in 1927, where menstrual tissue flows backwards through the fallopian tubes into the pelvic cavity.[7] The coelomic metaplasia theory suggests that peritoneal cells transform into endometrial-like cells under the influence of hormones and inflammatory factors.[8] Recent evidence supports the involvement of stem cells, suggesting that bone marrow-derived stem cells can differentiate into endometriotic lesions.[9] Additionally, immune dysfunction theory suggests that altered immune surveillance may fail to eliminate ectopic endometrial tissue, leading to the establishment and persistence of endometriotic lesions.[10]

Endometriosis diagnosis can be challenging due to the overlap of symptoms with other conditions, and a definitive diagnosis requires laparoscopic visualization and histological confirmation.[11] The current standard treatments include analgesics for pain management[12], hormonal therapies (including oral contraceptives, progestins, GnRH agonists)[13], and surgical interventions.[14] Although these conventional treatments may provide temporary relief, studies have shown that they can have significant side effects including hot flashes, mood changes, and bone density loss.[15] Moreover, recurrence rates after conventional treatments remain high, with studies reporting rates of 21.5% within 2 years after surgical treatment[16] and up to 50% within 5 years.[17]

Conventional treatment limitations have spurred interest in alternative therapies for endometriosis management. Traditional Chinese medicine (TCM) has long used herbal formulas to treat gynecological disorders, with Dane Fukang decoction emerging as a promising intervention to alleviate endometriosis symptoms and potentially alter disease progression. This review aims to comprehensively evaluate Dane Fukang decoction's therapeutic potential as an alternative or complementary approach to managing endometriosis.

## Pharmacological Mechanism of Dane Fukang Decoction

The therapeutic effects of Dane Fukang decoction are attributed to the multi-herbal formulation that consists of various medicinal plants. Radix Astragalus and Radix Angelicae Sinensis are the two main herbs that have been extensively researched for their pharmacological properties that are pertinent to the pathogenesis of endometriosis.[18, 19]

Radix Astragalus has been shown to modulate vascular endothelial growth factor (VEGF), a critical angiogenic factor in endometriotic lesion development.[20] By inhibiting VEGF expression, Astragalus exhibits anti-angiogenic effects that potentially suppress endometriotic tissue growth.

Radix Astragalus, a primary component of Dane Fukang decoction, has been shown to modulate the expression of vascular endothelial growth factor (VEGF), an angiogenic factor involved in the development and maintenance of endometriotic lesions. Inhibiting VEGF expression may cause Radix Astragalus to exhibit anti-angiogenic effects, which could result in the suppression of endometriotic tissue growth. TNF-α pathways can be influenced by Radix Angelicae Sinensis, another essential herb in the formula. Pain and inflammation in endometriosis are linked to TNF-α, a pro-inflammatory cytokine. Radix Angelicae Sinensis may help reduce inflammation and alleviate endometriosis-related symptoms by regulating TNF-α.[21]

In addition to their anti-angiogenic and anti-inflammatory qualities, Radix Astragalus and Radix Angelicae Sinensis also have immunomodulatory effects. The autoimmune component of endometriosis could be due to the ability of these herbs to regulate immune responses, which may contribute to their therapeutic benefits. The anti-inflammatory and angiogenesis effects in Dane Fukang decoction are believed to be stronger than those of individual herbal components due to the synergistic actions of the various herbs. This complex pathophysiology of endometriosis is attributed to the formula's effectiveness in managing it through a multi-targeted approach.

## Non-surgical Clinical Outcomes with Dane Fukang decoction

According to Chenchen and Xiaowen (2009), endometriosis, which is an estrogen-dependent disease with an unknown etiology, has a significant impact on both physical and mental health for women, and current conservative treatments are not satisfactory. Dane Fukang has been shown to have promising results as a potential treatment in recent studies. Endometrial stromal cells showed inhibition of proliferation, migration, and invasion when serum containing Dane Fukang was used, affecting 188 differentially expressed proteins as demonstrated by Faying et al. (2019). In an endometriosis rat model, Heck et al. (2012) observed that Dane Fukang had a significant reduction of MMP-9 mRNA and an increase of TIMP-1 mRNA expression, which suggests a regulatory mechanism. According to Peiya et al. (2017), Dane Fukang had a possible protective effect on endometrial tissue by decreasing lesion volume and VEGF/bFGF protein and mRNA levels in rats who had endometriosis. Yuling and Baozhi (2008) conducted a clinical study and compared Dane Fukang with gestrinone and Marvelon in 175 endometriosis patients, concluding that there was no significant disparity in effectiveness between the three treatments. However, the side effect profile of Dane Fukang was favorable, and only 1.47% of patients experienced liver dysfunction, which is lower than the rates of amenorrhea and weight gain with gestrinone. These findings indicate that Dane Fukang could present a promising alternative for endometriosis treatment, possibly targeting multiple pathways involved in the disease progression and maintaining a relatively safe profile.[22, 26]

After reviewing studies that involved over 2,000 patients, a comprehensive review revealed promising results for Dane Fukang decoction in treating endometriosis. In each study, Dane Funkang consistently demonstrated high efficacy, with total effective rates that ranged from 86.7 to 95.60%. The findings of numerous studies were that Dane Fukang's performance in alleviating dysmenorrhea symptoms, a major concern for endometriosis patients was superior. In Zheng et al. (2015), the Dane Fukang group showed a greater reduction in dysmenorrhea symptoms, although gestrinone had similar overall effectiveness.[27, 31]

Dane Fukang has a significant advantage in that it affects serum CA125 levels. Studies by Yang (2015), Shen and Wang (2012), and Zhu (2013) all reported substantial reductions in serum CA125 levels in patients treated with Dane Fukang, indicating a positive response to treatment.[32,35] The evidence suggests that Dane Fukang's effectiveness in managing the underlying pathology of endometriosis can be supported.

The safety profile of Dane Fukang was a prominent feature in this review. Multiple studies have shown that patients treated with Dane Fukang had significantly fewer adverse reactions than those treated with conventional treatments. According to Wang et al. (2013), no adverse reactions occurred in the Dane Fukang group, but 20% in the gestrinone group. This favorable safety profile was corroborated by other studies, including Xu et al. (2013) and Zhu (2010), suggesting that Dane Fukang could be a well-tolerated alternative for patients who experience side effects from conventional treatments.[36, 38] The side effects associated with Dane Fukang decoction are typically mild and transient, including gastrointestinal discomfort, nausea, and diarrhea, which often resolve spontaneously without necessitating treatment discontinuation.

In contrast, hormonal therapies such as gestrinone and GnRH agonists can induce more severe side effects, including menopausal symptoms, bone density loss, and metabolic disturbances. The long-term use of these medications may be limited due to their potential impacts on fertility and overall health. Dane Fukang decoction's favorable tolerability makes it a viable option for patients seeking long-term management of endometriosis symptoms without the concern of major side effects.

The findings of Wang et al. (2013) reported a significantly lower recurrence rate in the Dane Fukang group (6%) compared to the gestrinone group (21%). The suggestion is that Dane Fukang could have advantages in terms of long-term disease management and quality of life for endometriosis patients.[39]

## Post-surgical clinical outcomes with Dane Fukang decoction

This comprehensive review examines studies conducted between 2007 and 2019, investigating the efficacy and safety of Dane Fukang decoction in treating endometriosis and ovarian chocolate cysts in combination with laparoscopic surgery. The research consistently shows that Dane Fukang decoction is superior to conventional treatments such as gestrinone.

Chen Xiuhui and Chen Xiuling (2010), Li Ziyan (2012), Zeng Xiurong and Chen Rong (2017), Liao Hong et al. (2019), and Zhao Guiying (2013) all compared Dane Fukang decoction with gestrinone following laparoscopic surgery. These studies, involving 80 to 158 patients with follow-up periods ranging from 3 months to 3 years, consistently reported higher total effective rates (ranging from 90.0% to 94.54%) and lower recurrence rates (2.50% to 10.7%) in the Dane Fukang decoction groups. Liao Hong et al.(2019) also found a significantly lower complication rate (5.00% vs 25.00%) in the Dane Fukang decoction group.[40, 46] According to Xu Hong (2011),

the use of Dane Fukang decoction alone for endometriosis treatment resulted in significant symptom improvement and a decrease in serum CA125 levels, with no adverse side effects.[47]

The effectiveness of Dane Fukang decoction was evaluated by Zhang Caixia and Li Li (2007) when ovarian endometriosis cysts were treated with conservative intraperitoneal surgery.[48] Their findings indicate that the Dane Fukang has a higher efficacy rate and fewer side effects compared to gestrinone, making it notable for its ability to regulate immune function, improve microcirculation, and adjust endocrine function. Following surgery, Dane Fukang decoction maintains its safety advantages over traditional post-operative treatments for endometriosis. Patients receiving this herbal formula post-surgery tend to experience lower rates of adverse reactions compared to those undergoing hormonal therapies. The potential side effects remain mild and temporary, mirroring those observed in pre-surgical use. The use of Dane Fukang decoction post-surgery may help mitigate the risk of severe side effects associated with post-operative hormonal treatments. For patients requiring long-term symptom management after surgery, Dane Fukang decoction presents an attractive option due to its low risk of serious adverse effects.

All studies found that Dane Fukang decoction had a remarkable effect on symptoms like dysmenorrhea, non-menstrual abdominal pain, anal swelling, dyspareunia, and lumbosacral dystension. Liao Hong et al. (2019) also reported its superiority in reducing estradiol levels. All studies reported fewer side effects with Dane Fukang decoction than conventional treatments, which is a significant finding.[49]

## Conclusion

The multi-targeted actions of key herbs in Dane Fukang decoction, such as Radix Astragalus and Radix Angelicae Sinensis, which possess anti-inflammatory, anti-angiogenic, and immunomodulatory properties, address the complex pathophysiology of endometriosis. Clinical studies have consistently demonstrated the efficacy of Dane Fukang decoction in alleviating endometriosis-related symptoms, reducing disease progression, and improving quality of life, both as a standalone treatment and as an adjuvant therapy following laparoscopic surgery. Compared to conventional treatments like gestrinone and GnRH agonists, Dane Fukang decoction has shown superior efficacy in symptom relief, lower recurrence rates, and a more favorable safety profile with fewer adverse reactions. The combination of these advantages, accessibility, and cost-effectiveness makes Dane Fukang decoction a promising alternative for endometriosis management.

The limitations of the current evidence and the need for further research must be acknowledged. To confirm the effectiveness and safety of Dane Fukang decoction in diverse patient populations, well-designed, large-scale clinical trials are essential. Furthermore, mechanistic investigations are necessary to clarify the precise pharmacological effects and potential interactions of this herbal mix.

## Author Contributions

The study was written under the supervision of HC. PK wrote the manuscript and HC revise the manuscript. All authors commented and approved the manuscript prior to submission for publication.

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## Conflicts of Interest

The authors declare to have no conflict of interest.

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