

Clinical research progress of acupuncture and moxibustion in the treatment of ulcerative colitis

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Abstract: Ulcerative colitis (UC) is a chronic, relapsing inflammatory bowel disease primarily affecting the colonic mucosa, characterized by core clinical manifestations including diarrhea, abdominal pain, and hematochezia. Based on these manifestations, Traditional Chinese Medicine (TCM) classifies UC under disease categories such as "dysentery" and "diarrhea." The pathogenesis of UC remains incompletely elucidated but is believed to involve a complex interplay of immunological dysregulation, genetic predisposition, environmental factors, and gut microbiota alterations. Contemporary clinical management predominantly relies on pharmacological interventions, such as aminosalicylates, corticosteroids, immunomodulators, and biologics, which primarily target immune suppression to modulate inflammatory severity. However, these regimens often present limitations, including variable efficacy, significant adverse effects, high relapse rates upon discontinuation, and substantial economic burden, underscoring the need for complementary and alternative therapeutic strategies. Accumulating evidence suggests that acupuncture and moxibustion, as integral components of TCM, may serve as effective, safe, and well-tolerated complementary and alternative medical approaches for UC. These modalities are thought to exert their effects through multi-targeted mechanisms, including immunomodulation, anti-inflammatory actions, protection of the intestinal mucosal barrier, and regulation of the gut-brain axis. To systematically consolidate recent clinical experiences and research directions, this comprehensive review compiles, analyzes, and synthesizes relevant literature published in recent years concerning the application of acupuncture and moxibustion in UC treatment. It aims to provide an updated overview of their efficacy, potential mechanisms, safety profiles, and various application forms, thereby informing clinical practice and guiding future research endeavors.

Keywords: Ulcerative Colitis; Acupuncture and Moxibustion; Summary; Clinical Research

1. Introduction

Ulcerative colitis (UC) is a chronic, non-specific inflammatory bowel disease (IBD) characterized by continuous mucosal inflammation typically starting in the rectum and extending proximally to involve varying segments of the colon. Its hallmark clinical presentation includes diarrhea, abdominal pain, and rectal bleeding (hematochezia). The global burden of UC is significant and rising. As of 2023, it is estimated that over 5 million individuals worldwide are affected [1]. Epidemiological studies over the past two decades consistently report a steady increase in incidence and prevalence, particularly in newly industrialized regions, with a notable trend towards a younger age of onset [2]. The chronic and relapsing nature of UC poses a substantial challenge to long-term management. The chronic recurrence rate is considerable, and patients with long-standing, extensive colitis face an elevated risk of colorectal cancer, contributing to its status as a common and refractory condition within the spectrum of digestive system diseases, profoundly impacting patients' quality of life and imposing a significant socioeconomic burden [3].

Standard clinical management of UC primarily involves a step-up approach using chemical/pharmacological agents, including 5-aminosalicylates (5-ASAs) for mild-to-moderate disease, corticosteroids for inducing remission in moderate-to-severe flares, immunomodulators (e.g., thiopurines) for maintaining remission, and biologic therapies (e.g., anti-TNF agents, integrin inhibitors) for refractory or severe cases. The therapeutic goals are to control acute exacerbations, alleviate

symptoms, promote mucosal healing, prevent complications, and reduce the frequency of relapse [4]. Despite advances in pharmacotherapy, significant challenges persist. These include prolonged treatment courses, substantial adverse drug reactions (e.g., bone marrow suppression with immunomodulators, increased infection risk with biologics), heavy economic burdens associated with long-term or biologic therapy, and suboptimal patient adherence, all of which can compromise treatment outcomes. Consequently, the upward trend in UC incidence and the limitations of conventional therapy have not been sufficiently curbed, driving the exploration of complementary and integrative treatment modalities.

Within this context, acupuncture and moxibustion, as cornerstone therapies of TCM with a history spanning millennia, have garnered increasing attention for their potential role in managing UC. As summarized in Figure 1, these therapies constitute a comprehensive multimodal system rather than isolated interventions. Characterized by their holistic approach, purported efficacy, favorable safety profile, and minimal side effects, they offer a promising adjunctive or alternative option. A growing body of clinical evidence suggests that these interventions can ameliorate symptoms, reduce inflammation, and improve the quality of life for UC patients. To systematically appraise and disseminate the accumulating clinical experience and research findings, this article provides a comprehensive summary and critical analysis of the recent clinical research progress in acupuncture and moxibustion therapy for ulcerative colitis.

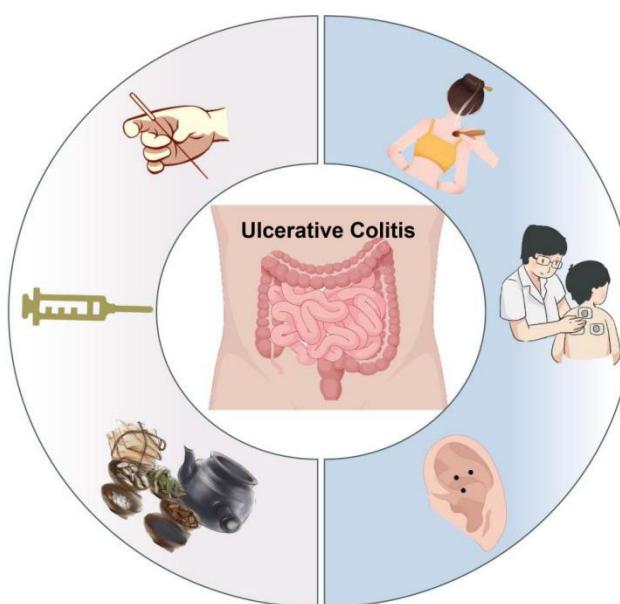


Figure 1. Overview of the Multimodal Therapy System of Acupuncture and Moxibustion for Ulcerative Colitis

Acupuncture and moxibustion for the treatment of ulcerative colitis is not a single therapy but a structurally complete, well-defined, diversified, and personalized therapeutic system. Through the flexible application of core therapies and combined strategies, this system can holistically regulate the neuro-immune-endocrine network, repair the intestinal mucosal barrier, and improve the intestinal microenvironment, thereby providing UC patients with an efficient, safe, and complementary comprehensive treatment plan.

2. Overview of Acupuncture and Moxibustion Therapy

2.1 Acupuncture Therapy

Acupuncture is an external treatment modality with a profound historical and theoretical foundation within TCM. It involves the insertion of fine, sterile metallic needles into specific anatomical locations on the body known as acupoints. The selection of acupoints is guided by the sophisticated theoretical framework of TCM, primarily based on meridian (Jing Luo) theory and the principles of Zang-Fu organ differentiation. The therapeutic intent is to regulate the flow of Qi (vital energy) and Blood (Xue), balance Yin and Yang, and unblock the meridians, thereby restoring the functional harmony of the internal organs. The procedural technique is meticulous, involving precise needle manipulation

methods such as "lifting and thrusting" and "twisting and rotating" to elicit the characteristic "De Qi" sensation—a feeling of soreness, numbness, heaviness, or distension around the needle site, considered indicative of effective acupoint stimulation [5]. This therapy emphasizes "effective regulation of Qi," features standardized operational protocols, and possesses a broad range of indications. It has been extensively applied across diverse clinical specialties for centuries and is progressively gaining recognition within modern medical systems, establishing itself as a representative treatment method epitomizing the unique characteristics and efficacy of TCM.

2.2 Moxibustion Therapy

Moxibustion constitutes another fundamental pillar of TCM therapeutics, utilizing *Artemisia vulgaris* (mugwort) processed into moxa wool, which is then fashioned into cones or sticks. The therapy involves applying heat generated by the burning moxa to specific acupoints, either directly on the skin or indirectly through insulating materials like ginger or salt. The therapeutic effect is achieved through a combination of the thermal energy from the moxa fire and the purported medicinal properties of the mugwort, which are believed to permeate the body through the acupoints [6]. This combined stimulus warms and invigorates the meridians, promotes the smooth circulation of Qi and Blood, strengthens the body's vital resistance (Zheng Qi) to eliminate pathogenic factors (Xie Qi), and harmonizes Yin and Yang. Consequently, moxibustion is employed both for treating diseases and for health preservation and preventive purposes. Its applications are particularly noted for conditions characterized by Cold, Deficiency, or Stagnation patterns according to TCM diagnosis.

3. Clinical Application and Research Progress

3.1 Acupuncture Therapy

Clinical investigations into the efficacy of standalone acupuncture for UC have yielded promising results. Huang Yongjie [7] conducted a study examining the clinical efficacy of traditional Chinese acupuncture in treating chronic UC. Ninety-six patients were randomly allocated to either an acupuncture group (n=48) receiving traditional acupuncture or a conventional group (n=48) treated with standard Western medication. The findings demonstrated a significantly higher total effective rate in the acupuncture group compared to the conventional group ($P < 0.05$), alongside a notably lower incidence of adverse reactions ($P < 0.05$), highlighting both the efficacy and safety of acupuncture.

In a study by Huang Jiesi et al. [8], 60 UC patients were randomized to an observation group (acupuncture treatment) or a control group (oral mesalazine enteric-coated tablets). Post-treatment assessment revealed that both interventions were effective in improving objective disease indices, including the intestinal endoscopy score (Baron score) and the disease activity index (Mayo index), with no statistically significant inter-group differences observed. However, regarding TCM syndrome improvement, the acupuncture group exhibited superior alleviation of symptoms such as emotion-related triggers, chest and hypochondriac pain, belching, and sighing compared to the control group. Furthermore, the acupuncture group demonstrated more significant regulation of key neurotransmitters involved in the brain-gut axis, including serum serotonin (5-HT), corticotropin-releasing factor (CRF), vasoactive intestinal peptide (VIP), and substance P (SP). This suggests that the therapeutic mechanism of acupuncture in UC may involve the modulation of the neuroendocrine system via the brain-gut axis, leading to reduced inflammation, promotion of intestinal mucosal repair, and a positive regulatory impact on emotional states, thereby constituting a safe and effective treatment strategy.

Li Chunling et al. [9] observed 60 UC patients, employing a design where a control group received oral mesalazine, while a combination group received mesalazine plus acupuncture at specific acupoints. Evaluations encompassing clinical efficacy, Baron score, and Geboes score for colonic mucosal healing were conducted. The results indicated that the combination group achieved superior clinical efficacy compared to the control group. Acupuncture significantly ameliorated the clinical symptoms of UC, reduced the recurrence rate, and proved to be safe and reliable without serious adverse reactions.

Collectively, these research findings indicate that acupuncture therapy can modulate systemic levels of inflammatory factors, enhance immune function, and positively influence the structure of intestinal flora [10]. It effectively alleviates intestinal mucosal barrier damage and associated inflammatory responses in UC models, while demonstrating a more favorable safety profile compared to conventional Western medicine. The unique advantages of acupuncture lie in its multi-targeted and

holistic regulatory approach, offering clear efficacy, good safety, and high potential for clinical promotion.

3.2 Moxibustion therapy

Moxibustion, either as a monotherapy or integrated with other treatments, represents a valuable complementary and alternative approach for UC. Zhang Jiacheng et al. ^[11], through a literature review spanning two decades, concluded that moxibustion can be tailored to different TCM syndromes of UC. It serves to reduce drug toxicity, enhance therapeutic efficacy, and improve overall intestinal inflammation. The protective effects of moxibustion on the intestinal mucosa are mediated through multiple pathways and levels, including the regulation of immune and inflammatory responses and the modulation of intestinal flora. Commonly identified TCM syndromes for moxibustion treatment in UC include Large Intestine Damp-Heat, Spleen Deficiency with Dampness Accumulation, Liver Depression and Spleen Deficiency, and Spleen-Kidney Yang Deficiency. High-frequency acupoint selection often involves Tianshu (ST25), Zhongwan (CV12), Shenshu (BL23), Guanyuan (CV4), Zusanli (ST36), Qihai (CV6), Pishu (BL20), Weishu (BL21), Dachangshu (BL25), and Shangjuxu (ST37). The predominant moxibustion techniques reported are ginger-isolated moxibustion and mild moxibustion ^[12].

Zhao Wenwen et al. ^[13] performed a meta-analysis to evaluate the clinical efficacy and safety of moxibustion for UC. The pooled results demonstrated that the total clinical effective rate of moxibustion was significantly higher than that of control groups (typically pharmacotherapy), and the incidence of adverse reactions was lower. Based on current literature, whether used adjunctively or as a standalone treatment, moxibustion exhibits good therapeutic effects on UC with a relatively low frequency of clinical adverse events. Thus, moxibustion not only offers practical advantages such as simple operation, ease of mastery, cost-effectiveness, ease of promotion, and minimal location restrictions, but numerous studies have also confirmed ^[14] its ability to achieve protection and repair of the intestinal mucosal barrier via multiple targets and effectively regulate the levels of various inflammatory factors.

3.3 Combination of Acupuncture and Moxibustion with Other Therapies

The TCM therapeutic arsenal is rich and diverse, encompassing internal herbal medicine, enema formulations, acupuncture, moxibustion, and other acupoint stimulation techniques. While individual therapies possess distinct advantages and relatively few adverse reactions, they may have inherent limitations. Clinical practice increasingly demonstrates that combining different therapeutic modalities can yield synergistic effects, enabling complementary and enhanced efficacy, thereby optimizing overall treatment outcomes. To further improve therapeutic effects, alleviate patient suffering, and shorten treatment duration, the integrated application of various TCM methods, as well as their combination with Western medicine, has become a common clinical strategy. Among these, the combination of acupuncture and/or moxibustion with Chinese herbal medicine or Western medicine for UC treatment ^[15] is gaining wider acceptance in clinical practice, demonstrating substantial practical value and promising development prospects.

Chen Tian et al. ^[16] investigated the clinical efficacy of a modified Gegen Qinlian Decoction combined with acupuncture in UC patients. They observed that after the combined treatment, scores for TCM syndromes, Geboes index, disease activity index, Baron score, levels of inflammatory factors, and immunoglobulins (IgG, IgM) were significantly reduced. This indicates that the combination of modified Gegen Qinlian Decoction and acupuncture can alleviate clinical symptoms in patients with Damp-Heat type UC, promote disease recovery, improve immune function and quality of life, and reduce relapse rates. Other studies have found that acupuncture combined with Tong Xie Yao Fang (Painful Diarrhea Formula) ^[17] led to a significant decrease in serum inflammatory factor levels, normalization of intestinal flora, and improved recovery of intestinal function post-treatment. Regarding integration with Western medicine, acupuncture combined with mesalazine ^[18] has been shown to significantly improve clinical symptoms in UC patients. Acupuncture can also be effectively combined with moxibustion itself ^[19], and other combined approaches include integration with cupping therapy ^[20], among others.

3.4 Other Acupuncture-Related Therapies

Beyond conventional needle acupuncture and direct moxibustion, the field of acupuncture offers

several other therapeutic variations for UC, such as acupoint application, auricular acupressure, acupoint embedding, electroacupuncture, acupoint injection, and intradermal needling. Research supports the efficacy of these modalities.

3.4.1 Acupoint Embedding Therapy

Liu Miao et al. [21] found that acupoint embedding therapy in UC patients resulted in reductions in abdominal pain, hematochezia, diarrhea scores, Sutherland Disease Activity Index (DAI) scores, colonoscopy scores, and the relative expression levels of NF- κ B and TLR4 proteins and their mRNAs. This suggests that acupoint embedding can improve clinical symptoms, promote repair of the diseased mucosa, and its mechanism may be associated with the downregulation of NF- κ B and TLR4 mRNA and protein expression.

3.4.2 Acupoint Application Therapy

Tang Jingyun et al. [22] systematically analyzed the therapeutic effect of acupoint application on UC patients. Their analysis concluded that acupoint application has a significant therapeutic effect on UC, with statistically significant differences in effective rate, TCM syndrome efficacy, and serological indicators between experimental (acupoint application) and control groups.

3.4.3 Acupoint Injection Therapy

Bian Tun [23] utilized a regimen of TCM retention enema combined with acupoint injection to treat UC. This combined approach was found to significantly enhance clinical efficacy, effectively relieve abdominal symptoms and signs, and promote disease recovery.

3.4.4 Auricular Acupressure Therapy

Chen Hongxia et al. [24] observed the impact of auricular massage combined with auricular acupressure (using vaccaria seeds) on the psychological state of UC patients. They discovered that this combination could significantly regulate the psychological state of patients, alleviating anxiety and depression, and consequently improving their quality of life.

4. Discussion and Mechanistic Insights

The therapeutic mechanisms underlying acupuncture and moxibustion in UC are complex and multi-faceted, aligning with the holistic principles of TCM. Modern research suggests these interventions act through multiple targets and pathways to achieve overall regulation of the body's state. Key proposed mechanisms include:

(1) Regulation of Immune and Inflammatory Responses: Acupuncture and moxibustion have been shown to modulate the production and balance of pro-inflammatory and anti-inflammatory cytokines (e.g., TNF- α , IL-1 β , IL-6, IL-10), thereby attenuating the uncontrolled inflammatory cascade characteristic of UC [8, 25].

(2) Protection and Repair of the Intestinal Mucosal Barrier: These therapies may enhance the expression of tight junction proteins (e.g., occludin, ZO-1) in the intestinal epithelium, reducing intestinal permeability and preventing the translocation of luminal antigens that drive inflammation. They also promote mucosal healing and repair [9, 14].

(3) Modulation of the Brain-Gut Axis (BGA): As evidenced by studies showing changes in neurotransmitters like 5-HT, CRF, VIP, and SP [8], acupuncture can influence the bidirectional communication between the central nervous system and the enteric nervous system. This modulation can alleviate visceral hypersensitivity, normalize gut motility, and potentially impact the psychological comorbidities often associated with UC.

(4) Regulation of Intestinal Flora (Microbiota): Emerging evidence indicates that acupuncture and moxibustion can help restore the homeostasis of the gut microbiome, increasing beneficial bacteria and reducing pathogenic species, which plays a crucial role in maintaining intestinal immune balance [10, 17].

Inhibition of Colonic Fibrosis: In chronic, long-standing UC, fibrosis can lead to strictures. Some studies suggest these therapies might inhibit pathways involved in fibrogenesis, potentially preventing this complication [25].

Improvement of Microcirculation: Moxibustion, through its thermal effects, is believed to improve local blood circulation in the intestines, facilitating the removal of inflammatory mediators and delivery

of nutrients, which aids tissue repair.

The various forms of application—such as manual acupuncture, electroacupuncture, warm needle moxibustion, indirect moxibustion, and acupoint application—offer flexibility in treatment planning. They can be selected and combined based on the patient's specific condition, TCM syndrome differentiation, and individual tolerance.

5. Conclusion and Prospects

In recent years, the global incidence and prevalence of ulcerative colitis have continued to rise. Its protracted disease course, relapsing nature, and potential for complications significantly impair patients' quality of life. In the pursuit of more efficient, safe, and well-tolerated treatment strategies, acupuncture and moxibustion, as time-honored components of TCM, have progressively demonstrated substantial clinical value. Their efficacy, particularly in alleviating core symptoms like abdominal pain, diarrhea, and mucopurulent bloody stools, is supported by a growing body of evidence. When used as adjunctive therapy, they may help reduce the dosage of conventional medications, mitigate associated adverse drug reactions, and potentially lower relapse rates.

In conclusion, acupuncture and moxibustion hold broad and promising application prospects within the comprehensive and integrated management framework for UC. Their safety, effectiveness, practicality, and high patient acceptance are increasingly recognized. However, to further consolidate their evidence base, optimize protocols, and promote wider clinical adoption, several steps are necessary. Future research should prioritize large-scale, multi-center, rigorously designed randomized controlled trials (RCTs) with longer follow-up periods. Furthermore, deeper exploration into the molecular and systemic mechanisms of action, standardization of treatment protocols (acupoint selection, stimulation parameters, treatment frequency), and identification of potential biomarkers for predicting treatment response are crucial. Through continuous refinement of acupuncture and moxibustion treatment strategies and mechanistic investigations, these valuable TCM modalities can be better leveraged to serve the needs of UC patients worldwide.

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