META-ANALYSIS

Efficacy and Adverse Reactions of Dahuang Mudan decoction Combined with Laparoscopy in the Treatment of Appendicitis: A Meta-Analysis

Shengbo Cong, MD; Guangli Wu, BD; Yuanbo Jin, BD; Lijun Zhu, MD

ABSTRACT

Background • Appendicitis is a common acute abdominal disease. Traditional Chinese medicine believes that acute appendicitis is caused by the accumulation of heat and toxin, and the formation of carbuncle and pus in the colon due to stasis. Therefore, treatment should be carried out to clear heat and detoxify, clear the organs, and eliminate carbuncle. Dahuang Mudan Tang contains various traditional Chinese medicines for clearing heat and detoxifying, which can be used to treat appendicitis. This study observes the therapeutic effect of Dahuang Mudan Tang on patients undergoing laparoscopic surgery for acute appendicitis.

Methods • Eight databases were searched by computer and inclusion criteria were pre determined before evaluation: (1) patients with appendicitis; (2) 18-70 years old; (3) Agree to this study and obtain randomized controlled trials at home and abroad on the combined treatment of appendicitis with caesarean section and rhubarb peony testing. Using RevMan 5.3 software, conduct a comprehensive evaluation of the cultivation quality and conduct data analysis.

Results • The meta-analysis ultimately included 16 papers. They are all considered randomized controlled trials. The

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INTRODUCTION

Appendicitis is a common acute abdomen that can occur in different age groups,¹ with an incidence of about 7% to 8% in adults.² The appendix is a slender blind tube-like structure that makes it prone to acute inflammation due to lumen obstruction and tissue ischemia. The typical symptoms of appendicitis include blurred pain around the umbilicus, anorexia/nausea/intermittent vomiting, pain metastasis to overall efficiency of the test unit and control unit was reported in 12 surveys. The total effective rate of the experimental group was significantly higher than that of the control group (Odds Ratio (OR): (1.16; 95% Cl: 1.11,1.20; P < .001), and the duration of bowel sounds was also significantly higher than that of the control group. Standardized mean deviation (SMD): (-7.39; 95% Cl: -8.48, -6.30; P < .01), defecation time SMD: (-1.60; 95% Cl: -2.07, -1.12; P < .01).

Conclusion • Based on the total effective rate, defecation time, defecation time, CRP, IL-6, and adverse reactions of participants in this study, the combination of Dahuang Mudan Tang and laparoscopy in the treatment of appendicitis may be beneficial, which can improve clinical efficacy, inhibit inflammatory reactions, and promote postoperative recovery of patients. It is worth promoting and applying in clinical practice. However, these findings still require more high-quality research to confirm. Patients undergoing laparoscopic surgery for appendicitis were treated with Dahuang Mudan Tang combined with targeted intervention. (*Altern Ther Health Med.* 2023;29(8):822-829).

the lower right quadrant, and low fever. The pathological characteristics of appendicitis can be divided into simple appendicitis, suppurative appendicitis, gangrenous appendicitis, periappendic abscess and peritonitis.¹⁻²

Acute appendicitis can be treated by various methods, such as non-surgical treatment, open surgery, laparoscopic surgery, and natural orifice endoscopic surgery.

The first appendectomy was performed by Claudius Amyand in England in 1736. In 1886, Reginald Fitz of Harvard Medical School in the United States first described the natural course of appendicitis and used a new term appendicitis, suggesting surgical removal of the appendix to treat this condition. The greatest contributor to the progress in the treatment of appendicitis was Charles McBurney of the United States. In 1889, he reported a group of cases of appendicitis treated surgically and described the metastatic

abdominal pain of appendicitis and the projection of the appendix on the abdominal surface, which was later named after him as the famous "McBurney's point". The literature report on laparoscopic appendectomy was first completed and published by German doctor Semmk in 1983.4 With the continuous development and improvement of laparoscopic techniques in abdominal surgery, laparoscopic appendectomy has already been widely carried out and applied across the country. Most surgeons now choose laparoscopic appendectomy as their initial surgical option for treating acute appendicitis. Laparoscopic appendectomy is superior to traditional laparotomy in comparison. For example, laparoscopic appendectomy has a small surgical incision, extensive exposure, complete removal of abdominal pus, less trauma, mild postoperative pain, and quick recovery.5 Laparoscopic appendectomy has its limitations. It is not applicable in cases where there are abscesses or inflammatory masses around the appendix, malignant tumors of the appendix, necrosis and perforation of the appendix root, middle to late pregnancy with appendicitis, adhesion and unclear anatomical relationship between the appendix and adjacent organs, difficulty in controlling appendiceal artery bleeding, and a complex surgical history in the lower abdomen that do not meet the conditions for laparoscopic surgery. In addition, laparoscopic appendectomy surgery is difficult, equipment is expensive, and the overall cost is high.

Dahuang Mudan Decoction, which was first recorded in the "Golden Chamber Synopsis" by physician Zhang Zhongjing in the Han Dynasty, is composed of rhubarb, peony bark, peach kernel, winter melon seeds, and mirabilite five-flavored traditional Chinese medicine. A classic recipe for carbuncle. Rhubarb Mudan Decoction is a prescription of "Xiafa". According to traditional Chinese medicine theory, carbuncle caused by the accumulation of heat toxin or blood stasis can be cured by expelling heat and blood stasis. Dahuang Mudan Tang can regulate the balance disorder between the inflammatory and anti-inflammatory response systems of the body, improve the condition, and inhibit the excessive secretion of inflammatory cytokines such as interleukin-4 (IL-4), IL-6, and IL-10 during inflammation, thus playing a therapeutic role in inflammation. In the prescription, rhubarb is bitter and cold in taste and returns to the stomach, large intestine, liver, and spleen meridians; Accumulation of blood, heat toxin carbuncle, etc.; Cortex Moutan, bitter in nature and taste, acrid, slightly cold, returns to the heart, liver, kidney, lung meridians, has the effects of clearing heat and cooling blood, promoting blood circulation and dissipating blood stasis, and relieving deficiency heat, combined with rhubarb, A total of purging the bowels of damp heat and blood stasis, it is the sovereign medicine in the prescription. Glauber's salt softens firmness and disperses knots, assists rhubarb in removing real heat, and promotes its speed down; the peach kernel is good at breaking blood and helps the monarch's medicine to clear stagnation, all of which are the minister's medicine. Winter melon kernel clears dampness, guides intestinal dirt and turbidity, discharges

pus, and eliminates carbuncle; it is an adjuvant. In recent years, there has been much research on the pharmacodynamics and clinical application of this prescription, especially in treating the acute abdomen, which has achieved remarkable results. Clinically, Dahuang Mudan Decoction can treat various inflammatory diseases such as acute pancreatitis, acute appendicitis, pelvic inflammatory disease, ulcerative colitis, hemorrhagic fever with renal syndrome, acute hemorrhagic stroke, etc.

Previous studies have shown that rhubarb peony has the effects of clearing heat, resolving blood stasis, dispersing nodules, and reducing swelling. Mainly used for the treatment of initial intestinal carbuncle and early dampness heat stasis syndrome, it can eliminate appendicitis, reduce intestinal pressure, and improve blood circulation.⁶ Although there have been studies showing hope, a comprehensive analysis of existing evidence is needed to evaluate the efficacy of the combination of Dahuang Mudan Tang and laparoscopy in the treatment of appendicitis. We conducted a meta-analysis of this.

MATERIALS AND METHODS

Selection of Studies

Type of Study Design Random controlled trials (RCTs) on the outcomes of combining laparoscopy and Dahuang Mudan decoction in treating appendicitis have been published. Using a random number table method, 66 cases were divided into the study group and 66 cases into the control group. There were 31 males and 35 females in the study group; Age range from 20 to 54 years, with an average age of (33.59 ± 6.03) years; The average onset time was (44.17) \pm 15.08) hours; Pathological types: 34 cases of acute simple appendicitis, 22 cases of acute suppurative appendicitis, and 10 cases of acute perforated appendicitis; Pain location: 28 cases of fixed right lower abdominal pain and 38 cases of metastatic right lower abdominal pain. There were 27 males and 39 females in the control group; Age range from 22 to 56 years, with an average age of (34.03 ± 5.76) years; The average onset time was (43.49 ± 14.25) hours; Pathological types: 38 cases of acute simple appendicitis, 19 cases of acute suppurative appendicitis, and 9 cases of acute perforated appendicitis; Pain location: 31 cases of fixed right lower abdominal pain and 35 cases of metastatic right lower abdominal pain.

Participant Selection

Inclusion criteria. (1) Appendicitis Patients (Metastatic pain in the lower right abdomen, pain in pressing the Mack's point, signs of systemic infection, and consistent with imaging features). (2) Aged 18-70. (3) Agree to this study.

Exclusion criteria. (1) Pregnant and lactating patients. (2) Patients with combined blood and malignant tumors Patients with cognitive and intellectual impairments who are unable to communicate normally Patients with poor compliance and inability to cooperate with the treatment process Patients who do not agree to participate or withdraw

from this study midway Patients with drug allergies in this study Patients who do not meet surgical indications or have concomitant surgical contraindications.

Interventions Types

Dahuang Mudan Tang has the effects of relieving heat, removing blood stasis and dispersing nodules, and has a significant anti-inflammatory effect. The combination of Dahuang Mudan Tang and laparoscopic surgery can effectively alleviate the inflammatory response and pain in patients with acute appendicitis after laparoscopic surgery. The intervention category received Dahuang Mudan decoction coupled with laparoscopy in appendicitis management, and the control group received laparoscopy for patients with appendicitis.

Outcome Measures Types

Outcome indicators for patients with appendicitis: According to research, the assessment tools for Dahuang Mudan decoction combined with laparoscopy in the treatment of appendicitis are 1 Total Effective Rate; 2 Defecation Time; 3 Bowel Sound Time; 4 CRP; 5 IL-6; 6 Adverse Reactions.⁷ The literature included in this study evaluated outcome measures using at least one of the above scales.

Search Strategy

Cochrane Library, EMbase, China Biomedical Literature Database, VIP, PubMed, Web of Science, CNKI, and Wanfang are computer-accessible databases. Retrieve publications without language restrictions, and manually search related articles using Google Academic Search. The retrieval strategy includes a combination of 1 key term block (Inflammatory factors; IL-6) using medical topic titles (Dahuang Mudan disclosure; laparocopy; appendicitis) and text words. From its establishment until February 2022, the library has been conducting searches. The specific steps of the literature search are: (1) search for relevant documents in the Chinese and English databases, read the title, abstract, and Keywords to further identify the search terms for this study; (2) The English database search used "MeSH Terms" to identify the subject terms, searched using a combination of subject words and keywords.

Extraction of Data and Quality Evaluation

The abstract was initially screened, and after the initial screening, the literature screening results were obtained by reading the full text, and the process was completed independently by two researchers. Exchange screening results, discuss dissenting literature or consult a third researcher until the results are agreed upon. The information extracted from the data includes basic information about the literature, type of study, study object, sample size, intervention content, outcome measures, etc.

Statistical Analysis

RevMan, also known as "Review Manager", is an integrated and standardized specialized software provided by

the International Cochrane Collaboration Network for system evaluation workers. In addition to conducting statistical analysis, it can also meet the needs of English word processing and data organization. The interface is clear and easy to operate, and it can achieve functions such as forest map, subgroup analysis, funnel map, etc. The Review Manager program was used to carry out this meta-analysis (RevMan). Effects are combined: The outcome measures in this study were all measured data, and the tools used to evaluate are different. There are differences between scores; therefore, the standardized mean difference is used (standardized mean difference, SMD) and 95%Letters to the zone (confidence interval, CI) As an indicator of effect. (2) Heterogeneity test: Heterogeneity generally refers to the heterogeneity between included literature in meta-analysis, describing the differences and diversity in measurement results between participants, interventions, and a series of studies, or variations in the intrinsic authenticity between those studies. I^2 The statistic reflects the proportion of heterogeneity in the total variation of the effect quantity. Chi-square tests are used to determine whether there is heterogeneity between studies, if P > .1, $I^2 <$ 50%, The encompassed researches were more homogeneous, Proceed with a fixed-effects model Meta-analyses; if P < .1, I^2 \geq 50%, Heterogeneity was indicated in the included studies, Analyze heterogeneous sources, Clinical heterogeneity is absent, For meta-analysis, a random-effects model is used. Furthermore, possible differences in qualitative factors were subgroup analyzed. The classification in subgroup analysis divides the research object into different subgroups based on a certain characteristic gender, disease severity, etc. Then, the effect values of different groups are estimated and compared between subgroups. Subgroup analysis is one of the important methods for analyzing heterogeneous results, or used to answer questions about specific patients, intervention types, or research types. The use of funnel plots for publication bias in analysis is a simple scatter plot that reflects the estimated intervention effects of a single study under a certain sample size or accuracy, and can be used to identify publication bias or other biases. The advantage of funnel charts is that they are intuitive and can be seen directly.

RESULTS

Search Results

The search approach resulted in the identification of 459 items. After duplicate studies were eliminated, 60 literature were scanned using the abstract and title. The full texts of 21 articles were then reviewed. After a comprehensive text analysis, five records were eliminated for the reasons listed: data mismatch (n = 2) and missing data (n = 3). In the end, this meta-analysis included 16 papers (Table 1). This procedure is depicted in the PRISMA statement flow chart (Figure 1).

Total Effective Rate

The total effective rate refers to the proportion of clinical recovery, significant effectiveness, and effectiveness among the total medication population. The combined effectiveness rate

Table 1. The basic characteristics of the included studies.

	Sample	Man/	Age (years)			
Study	Size (T/C)	Woman	(Mean ± SD) (T/C)	Т	С	Main Outcomes
Li, 2021 ⁷	40/39	40/39	39.54 ± 3.15/ 38.55 ± 3.27	Decoction	Control	145
Wu, 2019 ⁸	59/59	63/55	42.93 ± 4.58/ 43.27 ± 4.69	Decoction	Control	1236
Bao, 20169	80/80	85/75	3.3 ± 1.5/3.5 ± 1.7	Decoction	Control	45
Guo, 2018 ¹⁰	51/51	54/48	41.51 ± 10.4/ 41.43 ± 10.3	Decoction	Control	23456
Zhuang, 202111	30/30	35/25	23-39/22-41	Decoction	Control	12345
Jiang, 201812	51/51	55/47	30.97 ± 12.71/ 32.67 ± 11.49	Decoction	Control	45
Sun, 202013	44/44	49/39	34.18 ± 5.94/ 34.09 ± 5.83	Decoction	Control	136
Hao, 2019 ¹⁴	65/65	69/61	31.51 ± 4.6/ 32.17 ± 4.5	Decoction	Control	1236
Xiao, 2017 ¹⁵	50/50	55/45	45.14 ± 13.17/ 45.26 ± 13.21	Decoction	Control	1
Zhu, 201816	70/70	79/61	31.7 ± 4.1/ 32.4 ± 4.6	Decoction	Control	16
Wang, 2022 ¹⁷	70/70	70/70	31.7 ± 4.1/ 32.4 ± 4.6	Decoction	Control	13456
Zhu, 2022 ¹⁸	45/45	51/39	48.65±3.14/ 48.72±3.08	Decoction	Control	136
Wang, 2017 ¹⁹	60/61	72/49	34.12 ± 11.25/ 33.54 ± 12. 81	Decoction	Control	136
Zhou, 2021 ²⁰	36/36	43/29	62.84 ± 5.62/ 62.75 ± 5.54	Decoction	Control	1346
Zhou, 2020 ²¹	36/36	35/37	33.26 ± 6.38/ 32.13 ± 6.45	Decoction	Control	1456
Yang, 201322	50/50	63/37	59.2 ± 12. 8/ 56.5 ± 11. 9	Decoction	Control	136

Abbreviations: T, trial group; C, control group; (1), Total Effective Rate; (2), Defecation Time; (3), Bowel Sound Time; (4), CRP; (5), IL-6; (6), Adverse Reactions.



of the test and control category was reported in 12 trials. The test group's overall effective rate was substantially greater than the control group's (OR: 1.16; 95% CI: 1.11,1.20; P < .01, Figure 2), according to meta-analysis (OR: 1.16; 1.11,1.20; P < .01). Low heterogeneity was seen in the outcomes of all of these studies, and a sensitivity analysis was carried out (Figure 3). As used in conjunction with laparoscopy, Dahuang Mudan

Figure 2. Forest illustration of the Total Effective Rate.











decoction increases the total effective rate in individuals with appendicitis compared to the control group. The entire effective rate was shown using a funnel graphic (Figure 4).

Bowel Sound Time

When the gastrointestinal tract is in motion, gas and liquid flow in the intestinal cavity, producing sounds called











intestinal sounds. After minimally invasive appendicitis surgery, if the patient's gastrointestinal function begins to recover, then the patient's intestinal sounds will appear. The bowel sound time of the sample population and the control population was reported in 11 research. According to metaanalysis, the experimental group's bowel sound time was considerably shorter (SMD:-7.39; 95% Cl: -8.48,-6.30; P < .01, Figure 5).

Defecation Time

During surgery, doctors use medical equipment to remove and suture the patient's body, which usually causes certain damage to the patient's body and may affect gastrointestinal function. One of the indicators for evaluating postoperative gastrointestinal function recovery in patients is postoperative defecation time. The defecation times of the test and control category were recorded in 5 trials. According to a metaanalysis, the experimental group's defecation time was noticeably shorter. (SMD:-1.60; 95% Cl: -2.07,-1.12; P < .01, Figure 6).

CRP

CRP, also known as C-reactive protein, mainly reflects the degree of human inflammatory response. The CRP of the test and control category were reported in 7 trials. The results of the

Figure 8. Forest illustration of the IL-6.



meta-analysis revealed that the test group's CRP was substantially reduced. (SMD: -4.86; 95% Cl: -7.59,-2.12; P < .01, Figure 7) then the control group.

IL-6

IL-6, also known as interleukin-6, is a common inflammatory indicator. Under normal circumstances, the content of serum interleukin-6 in the human body is relatively low. If there is an inflammatory reaction in the body, serum interleukin-6 will rapidly increase. After the inflammation recovers, serum interleukin-6 will also quickly return to normal levels. The IL-6 levels of the test and control group category were reported in 7 investigations. Meta-analysis revealed that the test group's IL-6 was noticeably decreased. (SMD: -9.95; 95% Cl: -15.13,-4.77; P < .01, Figure 8) then the control category.

Adverse Reactions

The adverse symptoms after appendectomy mainly include abdominal pain, nausea and vomiting, and fluid leakage from the wound site. The negative effects on the test and control category were documented in 11 investigations. The test group's adverse effects were noticeably less common, according to meta-analysis (OR: 0.44; 95% Cl: 0.25,0.76; P < .01, Figure 9) than the control category.





DISCUSSION

Traditional Chinese medicine is a treasure of the Chinese nation. Traditional Chinese medicine has a history of treating diseases for thousands of years, and people's demand for it is also increasing. Most traditional Chinese medicines enter the digestive tract through oral administration. First, they inevitably come into contact with intestinal bacteria, which have been proven to regulate intestinal flora and promote intestinal microbial homeostasis.²³⁻²⁵ For intestinal carbuncle, which is located in the intestine, the syndrome is the cohesion of heat and toxin, the colon, the meridian is blocked, the abdomen is swollen and full, and the pain refuses to be pressed, the Han Dynasty physician Zhang Zhongjing preferred Dahuang Mudan Decoction for treatment. Clinically, Dahuang Mudan Decoction has a good therapeutic effect on acute appendicitis, acute pancreatitis, acute pelvic inflammatory disease and another acute abdomen, suggesting that it can potentially treat inflammatory bowel disease. Clinical and experimental studies have proved that Dahuang Mudan Decoction has an ideal therapeutic effect on IBD.²⁶⁻²⁸ The results of the intervention of Dahuang Mudan Decoction in IBD animal models found that Dahuang Mudan Decoction can improve the inflammatory symptoms of IBD while regulating the body's innate immune function and the production of inflammatory cytokines TNF-α and IL-1β was significantly inhibited. In addition, Dahuang Mudan Decoction can also play a role in the treatment of IBD by regulating the levels of Treg cells in peripheral blood, mesenteric lymph nodes and intestinal mucosa of IBD mice, as well as the levels of IL-10 and TGF-β cytokines in serum.²⁹⁻³⁰

There is a dynamic balance between probiotics and opportunistic pathogens or harmful bacteria in the body's intestinal tract, and the probiotics and their metabolites in good growth indirectly inhibit the overgrowth of pathogenic bacteria.³¹ Studies have shown that traditional Chinese medicine can regulate intestinal flora, increase the number of probiotics, reduce the number of pathogenic bacteria, and restore the diversity of intestinal flora. For example, in vitro studies have found that Codonopsis polysaccharide can promote the growth of bifidobacteria, thereby improving the metabolism of acetic acid, and has a certain enhancement effect on the colonization resistance of bifidobacteria.³² After treatment of UC rats with astragalus polysaccharide, it can significantly increase the number of Bifidobacterium and Lactobacillus in the intestine, reduce the number of Enterococcus and Enterobacter, and restore the proportion of intestinal flora in rats, making it tend to normal; the volatile fatty acids in the colon The content of astragalus polysaccharides increased, indicating that astragalus polysaccharides have a regulatory effect on intestinal flora imbalance and reduction of volatile fatty acids.³³⁻³⁴

Western medicine combined with Dahuang Mudan decoction can significantly reduce the content of peripheral blood endotoxin in patients with acute abdomen, inhibit the production of inflammatory mediators, and reduce the production of endotoxemia, thereby improving the prognosis. That is, the combination of Dahuang Mudan Decoction based on Western medicine to treat acute abdomen endotoxemia has a significant effect on patients with constipation, abdominal distension, anorexia, nausea and vomiting, and the plasma endothelin content on the 5th and 7th days of treatment is significantly lower than that of pure western medicine.35 For patients with mild andmoderate disease, early intervention with TCMhas been shown to effectively prevent dis- ease transition into severe and critical state.³⁶ Oral administration of Rhubarb Mudan decoction before intestinal surgery can play a role in intestinal precleaning, which can effectively promote the recovery of intestinal motor function, reduce postoperative intestinal edema, reduce the secretion of inflammatory mediators, and promote tissue repair. Rhubarb Mudan decoction was used to decoct in water to observe its effect on intestinal precleaning during the perioperative period of abdominal surgery and compared with the routine oral administration of norfloxacin, metronidazole and soapy water enema the night before surgery. The results showed that Dahuang Mudan Decoction was earlier than the Western medicine group on the recovery time of abdominal sounds, exhaust, and defecation.³⁷ The patients with cholecystectomy started taking Dahuang Mudan Decoction 2 days before the operation, and the effect of the same period was compared with that of pure Western medicine. Dahuang Mudan Decoction can promote postoperative intestinal peristalsis, improve intestinal blood circulation, reduce postoperative complications, and promote wound healing. A clinical study found that after appendicitis patients took Dahuang Mudan decoction orally, the recovery time of an intestinal function to anal exhaust was significantly shorter than that of appendicitis patients who took plain water or did not take any drugs and water.³⁸ Oral administration of the mixture made of Dahuang Mudan decoction to treat intestinal emptying disorder after appendectomy and neostomin combined with gastrointestinal decompression.39-41

The appendix is a small tubular structure at the end of the cecum that contains many bacteria. In this case, the

appendix is too short with bezoars, parasites or mesentery, and the appendix is distorted, resulting in an accumulation of secretions, increased internal pressure, and obstruction of blood flow, allowing bacteria originally in the appendix cavity to use the Invasion of damaged mucosa, an inflammatory reaction occurs. The appendix mucosa is rich in lymphoid tissue, and the submucosal lymphoid tissue can also block the appendix cavity after swelling. Congenital appendix malformations and gastrointestinal dysfunction can also lead to appendix infection.42 The combination of Dahuang Mudan Tang and laparoscopic surgery can effectively alleviate the inflammatory response and pain in patients with acute appendicitis after laparoscopic surgery, reduce the incidence of complications, improve traditional Chinese medicine symptoms, and improve traditional Chinese medicine symptoms. It has good clinical application value.

In the early stage of acute appendicitis, the pathological manifestations are only simple mucosal changes, which can be cured by anti-inflammatory treatment. However, the clinical symptoms and signs are often unable to determine the disease accurately. Suppose the purulent and gangrenous pathological changes are mistaken for simple mucosal inflammatory changes, after anti-infective treatment, although the inflammation of the appendix may subside. In that case, the scars will remain, which will still cause recurrent inflammation in the future. Suppose the pathological changes are not controlled in time. In that case, the pathological manifestations will continue to develop and develop into periappendiceal abscess, diffuse peritonitis, suppurative portal phlebitis, and multiple liver abscesses, thus aggravating the condition. Therefore, surgery should be performed as soon as possible after the diagnosis of most appendicitis.43-44 Dahuang Mudan decoction in combination with laparoscopy, may be beneficial for treating appendicitis, which will help patients overcome a hard time.

Limitations

The limitations of this systematic review are that only Chinese and English literature were searched, no other language literature was obtained, and there may be incomplete research inclusion and bias in selection. Therefore, you should be objective about some of the results of this Meta-analysis.

CONCLUSION

Based on the total effective rate, bowel sounds time, defecation time, CRP, IL-6, and adverse reactions of participants in this study, the combination of Dahuang Mudan Tang and laparoscopic treatment for appendicitis may be beneficial. Compared with laparoscopic surgery alone, its efficacy and safety have significant advantages. However, these findings still require more high-quality research to confirm. It suggests that the combined application of Dahuang Mudan Tang is feasible for treatment.

DATA AVAILABILITY

The data used to support this study is available from the corresponding author upon request.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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