DOI: 10.53469/jcmp.2026.08(01).41

Advances in the Integrated Traditional Chinese and Western Medicine Treatment of Colorectal Cancer

Hu Geng[1], Chen Jie[2,*]

[1]Shaanxi University of Chinese Medicine, Xianyang 712046, Shaanxi, China
[2]Shaanxi Provincial Hospital of Chinese Medicine, Xi'an 710003, Shaanxi, China
**Correspondence Author*

Abstract: ***In China, with the changes in lifestyle and dietary habits (such as high-fat, high-protein, and low-dietary-fiber diets), the incidence and mortality of colorectal cancer (CRC) continue to rise, making it one of the most common malignant tumors of the digestive tract in the country. Current treatment modalities mainly include surgery, radiotherapy, chemotherapy, immunotherapy, and molecular targeted therapy. Traditional Chinese medicine (TCM) has certain advantages in alleviating the toxic side effects of radiotherapy and chemotherapy, reducing postoperative tumor recurrence and metastasis, improving quality of life, and prolonging survival time. This article discusses the research progress of integrated traditional Chinese and Western medicine in the treatment of colorectal cancer in recent years, with the aim of informing clinical practice.***

Keywords: Colorectal cancer, Integrated traditional Chinese and Western medicine, Therapeutic progress**.**

1. Introduction

The incidence of colorectal cancer has shown a year-on-year increasing trend in middle-and low-income countries, ranking as the third most common malignancy in terms of global cancer cases and the second most common cause of cancer-related deaths [1]. The incidence and mortality rates of this disease are increasing annually. Western medicine is predominantly employed as the primary treatment modality, with surgery and chemotherapy being the most commonly used approaches. Traditional Chinese Medicine can be integrated throughout the entire course of colorectal cancer treatment at any stage, serving as an "adjuvant" and "synergistic" role rather than replacing mainstream modern medical therapies (such as surgery, radiotherapy, chemotherapy, immunotherapy, and targeted therapy). The combination of TCM and Western medicine enhances efficacy while reducing toxicity, thereby prolonging the disease-free survival and overall survival of patients with advanced colorectal cancer.

2. Treatment of CRC in Modern Medicine

2.1 Surgical Treatment

In most cases, the primary treatment modalities for CRC are radical surgery and perioperative comprehensive therapy, which improve patient cure rates and prolong survival. Currently, common surgical approaches include traditional open surgery, laparoscopic surgery, and robotic surgery. Among these, laparoscopic surgery is increasingly widely applied in the surgical management of CRC. Zhang Shilin et al. [2] Through the analysis of the short-term efficacy and long-term survival of patients with colorectal cancer treated by laparoscopic radical surgery versus traditional open surgery, it was found that compared with open surgery, laparoscopic radical surgery for colorectal cancer demonstrates definite efficacy, less trauma, reduced intraoperative blood loss, faster recovery of gastrointestinal function, significantly shorter hospitalization time, lower incidence of postoperative complications, and marked improvement in patients' quality of life. The long-term efficacy is comparable to that of open surgery. According to the China Colorectal Cancer Diagnosis and Treatment Guidelines (2023 Edition) [3] Early-stage colorectal cancer (cTIN0M0) refers to cancer cells that have penetrated the muscular layer of the colorectal mucosa and infiltrated into the submucosa but have not involved the muscularis propria. The treatment involves endoscopic resection, local resection, or segmental resection. For patients with T2-4, N0-2, M0 stage colorectal cancer, the preferred surgical approach is resection of the corresponding colon segment combined with regional lymph node dissection. For familial adenomatous polyposis, patients without malignant transformation should undergo total colectomy with pouch-anal anastomosis or total colectomy with ileorectal anastomosis (it is recommended that the anastomotic site be within 7 cm from the anal margin). For those with malignant transformation, the choice between total colectomy or segmental resection combined with endoscopic follow-up is necessary. For tumors invading surrounding tissues or organs, combined en bloc resection of the affected organ is recommended. For patients with cT4 stage, preoperative chemotherapy or chemoradiotherapy should be administered before performing colectomy. For patients with intestinal obstruction, the following options are recommended: primary resection with anastomosis or primary tumor resection with proximal stoma and distal closure, primary tumor resection with anastomosis plus proximal prophylactic stoma, secondary resection after stoma placement, or resection after stent implantation. If resection is not feasible, palliative treatments including surgery such as proximal stoma, bypass surgery, stent implantation, or intestinal obstruction catheterization may be considered. For patients with cT2-4N0-2M0 stage rectal cancer, radical surgical treatment is indicated. For mid-to-upper rectal cancer, low Anterior resection; for low-grade colon cancer, abdominoperineal resection should be performed cautiously if anal preservation is required. Patients with locally advanced mid-to-lower rectal cancer (CT 3-4 and/or N+) who show

imaging evidence prior to surgery are advised to undergo preoperative chemotherapy or chemoradiotherapy. For those with intestinal obstruction eligible for immediate resection, options include: primary resection with anastomosis, primary tumor resection with anastomosis plus proximal prophylactic stoma, Hartman procedure, post-stoma resection, or stent placement followed by timely resection after obstruction relief. For locally advanced cases unsuitable for resection or surgery, palliative and supportive care may be provided.

2.2 Chemotherapy

Chemotherapy (CT) for CRC is categorized into neoadjuvant CT, intraoperative CT, adjuvant CT, and palliative CT. According to the 2022 CSCO guidelines[4] is recommended that colorectal cancer patients with stage III and stage II colorectal cancer combined with risk factors should receive 3-6 months of postoperative adjuvant chemotherapy, which can reduce the recurrence and metastasis rate after surgery. According to the National Health Commission China Colorectal Cancer Diagnosis and Treatment Guidelines (2023 Edition)[5]. Adjuvant therapy is not recommended for stage T1-2N0M0 colorectal cancer. For stage II colon cancer patients without high-risk factors, follow-up or monotherapy with fluorouracil-based chemotherapy is advised. For those with high-risk factors, adjuvant chemotherapy is recommended. The recommended chemotherapy regimens include XELOX (oxaliplatin + capecitabine) or FOLFOX (oxaliplatin + fluorouracil + calcium folinate) based on oxaliplatin, or monotherapy with 5-FU/LV or capecitabine, with a treatment duration of 3-6 months. For stage III colorectal cancer patients, the recommended chemotherapy regimens are XELOX, FOLFOX, or monotherapy with capecitabine or 5-FU/LV. For stage T3-4 or N1-2 rectal cancer patients with a tumor distance from the anal margin <12 cm, preoperative neoadjuvant chemoradiotherapy is recommended. If neoadjuvant radiotherapy is not performed preoperatively, the decision to administer adjuvant chemoradiotherapy should be based on postoperative pathological findings, with fluorouracil-based regimens being preferred. For advanced or metastatic colorectal cancer, the recommended chemotherapeutic agents include 5-FU/LV, irinotecan, oxaliplatin, capecitabine, trifluridine, and cetuximab. The following combination chemotherapy regimens are recommended: FOLFOX/FOLFIRI + cetuximab, or XELOX/FOLFOX/FOLFIRI + bevacizumab. For third-line and beyond, regorafenib or furquintinib is recommended, or clinical trials may be considered, with trifluridine also being an option. For patients who cannot tolerate combination chemotherapy, the regimen 5-FU/LV or capecitabine is recommended. Bendalone monotherapy + targeted therapy.

2.3 Radiotherapy

Radiotherapy is a crucial component of comprehensive treatment for colorectal cancer, particularly for rectal cancer, which exhibits a higher local recurrence rate compared to colon cancer. Radiotherapy modalities include intracavitary radiation, external beam radiation, and combined external and internal beam radiation. Studies have found [6-8] Neoadjuvant radiotherapy can effectively improve the anal preservation rate in low rectal cancer, significantly enhance overall survival (OS) in rectal cancer patients, and reduce the recurrence rate.

2.4 Immunotherapy

Immunotherapy is primarily represented by immune checkpoint inhibitors (ICIs). The immune checkpoint molecules mainly include: 1. Cytotoxic T-lymphocyte-associated antigen 4 (CTLA4), such as ipilimumab; 2. Programmed death receptor-1 (PD-1), such as nivolumab, pembrolizumab, and pembrolizumab; 3. Programmed death receptor ligand-1 (PD-L1), such as atezolizumab. Based on the tumor microenvironment, colorectal cancer can be classified into: defective DNA mismatch repair (dMMR) or high-degree microsatellite instability (MSI-H), and proficient DNA mismatch repair (pMMR) or low-degree microsatellite instability (MSI-L) or microsatellite stable. The accumulation of DNA mutations in tumor cells of dMMR/MSI-H patients can lead to the production of tumor neoantigens and enhance tumor immunogenicity, thereby inducing more immune cell infiltration and a stronger anti-tumor immune response. In contrast, patients with pMMR/MSI-L tumors exhibit low immunogenicity and minimal immune cell infiltration, making it difficult to induce an effective antitumor immune response. Consequently, these patients demonstrate poor response to ICIs. A meta-analysis of the efficacy of PD-1 inhibitors in treating colorectal cancer.[9]A total of 297 colorectal cancer patients were enrolled, with PD-1 inhibitors including nivolumab and pembrolizumab. The study results demonstrated that PD-1 inhibitors could prolong overall survival (OS) and improve disease control rates in metastatic colorectal cancer (mCRC). Furthermore, in terms of molecular phenotypes, PD-1 inhibitors showed greater sensitivity in dMMR/MSI-H mCRC patients. In recent years, clinical studies increasingly incorporate PD-1/PD-L1 inhibitors in combination with targeted therapies and chemotherapy for first-line and early second-line treatment of colorectal cancer. These combinations have also demonstrated significant efficacy in adjuvant therapy, offering patients renewed hope.

2.5 Molecular Targeted Therapy

Molecular targeted therapy has become one of the important approaches in the treatment of malignant tumors. In the clinical management of colorectal cancer, multiple targeted drugs have been approved for use. Based on the signaling pathways they regulate, CRC-related targeted drugs can be classified into the following categories: 1. Epidermal growth factor receptor (EGFR) pathway: cetuximab, panitumumab, trastuzumab, pertuzumab; 2. V-raf sarcoma virus oncogene homolog B (BRAF) inhibitor: vemurafenib, darafinib; 3. Vascular endothelial growth factor (VEGF) pathway: bevacizumab, ramucirumab, furquintinib; 4. Multi-target tyrosine kinase inhibitor: regorafenib, lenvatinib.[10] with traditional chemotherapy, these targeted drugs exhibit superior anticancer efficacy with fewer side effects, yet they also present limitations such as susceptibility to drug resistance. Therefore, they are often clinically combined with chemotherapeutic agents or two targeted drugs with different mechanisms of action. The combination of chemotherapy regimens with targeted drugs can extend the median survival of advanced colorectal cancer patients to 24-28 months. [11] clinical practice, bevacizumab plus XELOX/FOLFOX/

FOLFIRI is commonly used to treat right-sided primary colorectal cancer, while cetuximab plus FOLFOX/FOLFIRI is employed for left-sided primary colorectal cancer [12].

3. Traditional Chinese Medicine in the Treatment of Colorectal Cancer

Traditional Chinese medical classics do not provide a definitive definition for the disease term “colorectal cancer.” Based on the symptomatic characteristics of colorectal cancer and records in relevant classical texts, it is categorized under the terms “intestinal fungus,” “intestinal accumulation,” “accumulation,” “mass,” “visceral toxin,” “dysentery,” “anal fistula,” “hematochezia,” “intestinal wind,” and “intestinal malformation” in Traditional Chinese Medicine [13]. The primary pathogenesis of colorectal cancer involves damp-heat, fire-toxicity, and blood stasis as its clinical manifestations, with spleen deficiency, kidney deficiency, and deficiency of vital qi as its root causes. These factors interact causally: deficiency leads to accumulation, and accumulation exacerbates deficiency, resulting in gradual enlargement of the tumor and further debilitation over time. Due to the varying stages of disease progression, clinical presentations differ among patients. Traditional Chinese Medicine lacks a unified diagnostic and therapeutic standard, with multiple schools of thought emerging, all focusing on treating the fundamental cause of “excessive yang qi.”[14]. Professor Shao Mengyang[15]. According to the differentiation of deficiency and excess, excess syndromes are classified into three types: damp-heat descending type, toxic pathogen accumulation type, and blood stasis accumulation type, which are treated with Huaihua Deyu Decoction, Huanglian Jiedu Decoction, and Xuefu Zhuyu Decoction, respectively. Deficiency syndromes include qi-blood deficiency type, spleen-kidney yang deficiency type, and liver-kidney yin deficiency type, which are treated with Guipi Decoction, Sishen Pill, and Zhibai Dihuang Pill, respectively. Professor Wang Yisheng [16] Rectal cancer is classified into three types: 1) Deficiency syndrome: Treatments include Shenling Baizhu San (Ginseng and Poria Powder), Buqi Yunpi Decoction, and Bufei Decoction, which aim to strengthen the spleen, resolve dampness, detoxify, and combat cancer, while also restoring intestinal function by tonifying the spleen and lungs. 2) Damp-heat syndrome: Formulations such as Bai Tou Weng Decoction and Shaoyao Decoction, supplemented with Baihua She She Cao (White-flowered Snakes Tongue Grass), Ban Zhi Lian (Half-Branch Lotus), San Leng (Three-Pronged), and E Zhu (Curcuma), are selected to enhance heat-clearing, dampness-resolving, detoxifying, and anticancer effects. 3) Qi-blood deficiency syndrome: Prescriptions like Bazhen Decoction and Shiquan Dabu Decoction are employed to replenish both qi and blood, thereby reinforcing the body’s defenses against cancer. Professor Sun Guizhi [17] Based on clinical experience in treating colorectal cancer, the following patterns are summarized: 1) Dampness-heat accumulation with downward invasion of the large intestine: Huaihua Diyutang (Modified Sophora Flower and Sanguisorba Decoction) or Shaoyao Tang (Modified Paeonia Decoction); 2) Spleen deficiency with dampness accumulation and toxin accumulation in the large intestine: Shenling Baizhu San (Modified Poria and Atractylodes Powder) or Huangqi Jianzhong Tang (Modified Astragalus and Middle-Trengthening Decoction); 3) Spleen-kidney yang deficiency with cold pathogen invading the intestine: Sijunzi Tang (Modified Four Gentlemen Decoction) combined with Sishen Wan (Modified Four Divine Pill); 4) Liver-kidney yang deficiency with fluid depletion and intestinal dryness: Liuwei Dihuang Wan (Modified Six-Ingredient Rehmannia Pill); 5) Deficiency of vital qi and excess of pathogenic factors with dual deficiency of qi and blood: Bazhen Tang (Modified Eight Precious Herbs Decoction).

In summary, the treatment of this disease in Traditional Chinese Medicine should differentiate between deficiency and excess patterns. Early-stage cases are predominantly characterized by excess syndrome, while middle-to-late stages are more often associated with deficiency syndrome. Excess syndrome typically manifests as damp-heat accumulation syndrome, toxic pathogen congestion syndrome, or blood stasis syndrome, whereas deficiency syndrome commonly presents as dual deficiency of qi and blood, spleen-kidney yang deficiency, or liver-kidney yin deficiency. The therapeutic principle should focus on reinforcing the body’s vital energy and consolidating the foundation, supplemented by eliminating pathogens and detoxifying, clearing heat and resolving dampness, as well as resolving stasis and promoting bowel movement, thereby assisting the large intestine in its function of transportation.

4. Integrated Traditional Chinese and Western Medicine Treatment

4.1 Surgical Combined with Traditional Chinese Medicine Treatment

1) Preoperative Traditional Chinese Medicine Therapy. Preoperative TCM therapy aims to improve the patients constitution, enhance immunity, optimize preoperative status, and increase surgical tolerance, while simultaneously reducing surgical trauma and postoperative complications. Commonly used TCM herbs include Astragalus membranaceus (Huangqi), Codonopsis pilosula (Dangshen), Angelica sinensis (Danggui), and Rehmannia glutinosa (Shengdihuang), which possess effects such as reinforcing healthy qi, consolidating the bodys foundation, clearing heat, and detoxifying. The application of TCM improves the patients’ physical condition, enhances surgical safety, and increases the success rate of the procedure.

2) Postoperative Traditional Chinese Medicine Therapy. Methods such as oral administration of Chinese herbal medicine, herbal patch application, herbal enema, and acupuncture can alleviate postoperative symptoms including pain, abdominal distension, diarrhea, and nausea, accelerate wound healing, promote the recovery of postoperative gastrointestinal function, and improve disease-free survival and overall survival rates. Studies have found that the application of herbal enema after laparoscopic radical surgery can reduce the incidence of abdominal distension, effectively enhance the body’s immune function, minimize damage to the intestinal mucosa, and facilitate the recovery of gastrointestinal function. [18] Acupuncture therapy can alleviate pain by stimulating acupoints.[19] Symptoms such as nausea and vomiting, and improving the patients psychological state.

4.2 Traditional Chinese Medicine-Assisted Radiotherapy and Chemotherapy

Traditional Chinese Medicine may exert its effects through multiple mechanisms in adjuvant radiotherapy and chemotherapy, primarily including the following aspects: 1) reducing toxicity and enhancing efficacy, thereby improving quality of life. Some TCM herbs, such as Scutellaria barbata, Hedyotis diffusa, Coptis chinensis, and Panax notoginseng, among others [20-21], Containing multiple antitumor active components, it directly inhibits tumor cell proliferation, induces apoptosis, and suppresses metastasis. When combined with radiotherapy and chemotherapy, it exerts multi-target and multi-pathway synergistic antitumor effects. Modern medical research has confirmed [22-24] Astragalus, Codonopsis, Angelica, Psoralea, and Ligustrum lucidum possess the effects of replenishing qi and nourishing blood, as well as tonifying the kidneys and generating essence. They can protect bone marrow function and mitigate the toxic side effects of radiotherapy and chemotherapy. 2) Regulating the body's state and reshaping the internal environment. Traditional Chinese Medicine can significantly modulate and restore the immune function suppressed by radiotherapy and chemotherapy, enhance the activity of immune cells, and improve immune surveillance and clearance capabilities. 3) Alleviating the toxic and adverse reactions of radiotherapy and chemotherapy. The administration methods of TCM include oral administration and injection [25]. and Traditional Chinese Medicine application [26] For instance, adjuvant chemotherapy and radiotherapy with Traditional Chinese Medicine can reduce the incidence and severity of adverse reactions such as diarrhea, oral ulcers, vomiting, alopecia, and hand-foot syndrome. Studies have shown that [27-28] This article discusses the application of integrated traditional Chinese and Western medicine therapies in colorectal cancer (CRC). For instance, the combined use of Traditional Chinese Medicine and chemotherapeutic agents can mitigate chemotherapy side effects, improve the tumor microenvironment, reduce tumor recurrence and metastasis, reverse drug resistance, and enhance chemotherapy sensitivity. The combination of TCM and radiotherapy can potentiate the cytotoxic effects of drugs on tumor cells, minimize damage to normal tissues, improve treatment efficacy, and enhance quality of life.

5. Outlook

Research on treatment methods for colorectal cancer is increasing, with both traditional Chinese medicine and Western medicine holding irreplaceable positions. TCM treatment has significantly improved the efficacy of colorectal cancer, enhanced immune function, and prolonged survival time. However, it lacks unified standards for syndrome differentiation and treatment, as well as staging criteria, primarily relying on patients subjective perceptions. Based on current research, future development faces challenges in precise integrated therapy and efficacy prediction, innovative TCM delivery and dosage forms, comprehensive and standardized management, integration driven by cutting-edge technologies, and deep collaboration in diagnostic and therapeutic models. By combining the advantages of TCM, we can establish standardized diagnostic and therapeutic protocols for colorectal cancer, enabling integrated TCM-Western medicine treatment to achieve precision, standardization, and comprehensive management.

References

[1] Malki A, Abu ElRuz R, Gupta I, et al. Molecular mechanisms of colon cancer progression and metastasis: Recent insights and advancements. Int J Mol Sci, 2021, 22(1):130.

[2] Zhang Shilin, Wei Guoxiang, Peng Houkun. Comparison of short-term efficacy and long-term survival between laparoscopic radical surgery and traditional open surgery in the treatment of colorectal cancer [J]. China General Surgery Journal, 2019, 28(7): 897-902.

[3] Chinese Society of Oncology, Department of Medical Administration, National Health Commission. China Colorectal Cancer Diagnosis and Treatment Guidelines (2023 Edition) [J]. Journal of Peking Union Medical College, 2023,14(04):706-733.

[4] China Clinical Oncology Society Guideline Working Committee. China Clinical Oncology Society (CSCO) Colorectal Cancer Diagnosis and Treatment Guidelines [M]. Beijing: Peoples Medical Publishing House, 2022.

[5] National Health Commission China Colorectal Cancer Diagnosis and Treatment Guidelines (2023 Edition) [J]. China Journal of Practical Surgery, 2023, 43(06): 602-630.

[6] GARCIA-AGUILAR J, PATIL S, GOLLUB M J, et al. Organ Preservation in Patients With Rectal Adenocarcinoma Treated With Total Neoadjuvant Therapy[J]. Journal of clinical oncology, 2022,40(23): 2546-2556.

[7] Zhao Yaru, Qiao Wenbo. Advances in neoadjuvant radiotherapy for rectal cancer [J]. Modern Oncology, 2022,30(19):3614-3617.

[8] Wang Anjun, Liu Ningning. Efficacy analysis of radiotherapy in rectal cancer patients undergoing chemotherapy and surgery: A Retrospective study based on the SEER database[J]. Journal of Shanghai Jiao Tong University (Medical Edition), 2023,43(03):320-332.

[9] HE S, HU D, FENG H, et al. Efficacy of immunotherapy with PD-1 inhibitor in colorectal cancer: a meta-analysis[J]. Journal of Comparative Effectiveness Research, 2020,9(18): 1285-1292.

[10] Yang Guohua. Advances in Molecular Targeted Therapy for Colorectal Cancer [J]. China Geriatrics Journal, 2021,41(22):5164-5168.

[11] Zhang Weihua, Hao Liping. Advances in Molecular Targeted Therapy for Colorectal Cancer[J]. Journal of Lanzhou University (Medical Edition), 2011, 37(2): 69-73,78.

[12] TEJPAR S, STINTZING S, CIARDIELLO F, et al. Prognostic and Predictive Relevance of Primary Tumor Location in Patients with RAS Wild-Type Metastatic Colorectal Cancer: Retrospective Analyses of the CRYSTAL and FIRE-3 Trials[J]. JAMA oncology, 2017, 3(2): 194-201.

[13] Zhang ZH, Yang YJ, Hua Baojin. Hua Baojins application of Banxia Xiexin Decoction in the treatment of colon cancer: Experience [J]. Chinese Journal of Traditional Chinese Medicine, 2020,35(12):6135-6137.

[14] Xu Bowen, Li Jie, Gao Ruike, et al. Exploring the TCM differentiation and treatment of tumors based on the theory of Yang transforming Qi, Yin forming shape [J]. Chinese Journal of Traditional Medicine, 2020,61(4):315-318.
[15] Shao M. Experience in Traditional Chinese Medicine Treatment of Rectal Cancer [J]. Henan Journal of Traditional Chinese Medicine, 1998(5):268.
[16] Wang Yisheng. Understanding and Treatment of Rectal Cancer [J]. Henan Journal of Traditional Chinese Medicine, 1998(5):268-269.
[17] He Lili, Sun Guizhi. Professor Sun Guizhis Experience in Treating Colorectal Cancer [J]. Journal of Liaoning University of Traditional Chinese Medicine, 2009(4):99-101.
[18] Li Xianjun, Sun Jiming, Yang Shuangling, et al. Effects of Qishen Fuchang Decoction Retention Enema on Cellular Immune Function and Intestinal Mucosal Injury after Laparoscopic Radical Resection of Rectal Cancer [J]. China Journal of Integrated Traditional Chinese and Western Medicine in Digestive Diseases, 2020, 28(11): 55-59.
[19] LI X M, YUAN D Y, LIU Y H, et al. Panaxnotoginsengsaponins prevent colitis-associated colorectal cancer via inhibition IDO1 mediated immune regulation [J]. Chin J Nat Med, 2022, 20(4) :258-269.
[20] HU Y Y,GUO N,YANG T,etal. The potential mechanisms by which Artemisinin and its derivatives induce ferroptosis in the treatment of cancer [J]. Oxid Med Cell Longev, 2022:1458143.
[21] TAN M M,CHEN M H,HAN F,etal. Role of bioactive constituents of Panax notoginseng in the modulation of tumorigenesis: a potential review for the treatment of cancer [J]. Front Pharmacol, 2021, 12: 738914.
[22] Xu Hao, Huang Xiaoping, Zhang Wei, et al. Effects of the main active components of Astragalus and Angelica sinensis on hematopoietic function in myelosuppressive mice [J]. China Pharmacological Bulletin, 2019, 35(5): 707-713.
[23] JI H Y, YU J, JIAO J S, et al. Ultrasonic-assisted extraction of Codonopsis pilosula glucofructan: optimization, structure, and immunoregulatory activity [J]. Nutrients, 2022, 14 (5):927.
[24] WANG H, YIN H M, ZHOGN Y D, et al. Polysaccharides from fermented coix seed modulates circulating nitrogen and immune function by altering gut microbiota [J]. Curr Res Food Sci, 2022, 5:1994-2003.
[25] Wang Jing, Shi Zhongmei, Han Rui, et al. Preliminary observation on the impact of traditional Chinese medicine injections on the quality of life of cancer patients treated with adjuvant radiotherapy and chemotherapy [J]. China Pharmacist, 2018, 21(6): 1074-1076.
[26] Du Yanqiu, Zhang Xinfa, Guan Xia, et al. Therapeutic effect of traditional Chinese medicine acupoint therapy combined with aripiprazan triple therapy on gastrointestinal adverse reactions caused by highly emetogenic chemotherapy regimens [J]. China Community Physician, 2023, 39(22): 45-47.
[27] Zheng Jialu, Zheng Jinzhou, Gu Xian. Efficacy study of Tenglong Buzhong Decoction combined with chemotherapy in the treatment of advanced colorectal cancer [J]. Shaanxi Journal of Traditional Chinese Medicine, 2023, 44(8): 1042-1046.
[28] Liu T. A web meta-analysis comparing six traditional Chinese medicine injections combined with chemotherapy for improving therapeutic efficacy and immune function in cancer patients [D]. Shenyang: Liaoning University of Traditional Chinese Medicine, 2023.