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EDITORIAL

- 6754** Update on the aetiopathogenesis of obstructive sleep apnea: Role of inflammatory and immune mediated mechanisms
Nag DS, Varghese K, Swain A, Patel R, Sahu S, Sam M
- 6760** Intensive care unit-acquired weakness: Unveiling significant risk factors and preemptive strategies through machine learning
He XY, Zhao YH, Wan QW, Tang FS
- 6764** Advancing oral cancer care: Insights from Tongluo Jiedu prescription
Cheng CY, Hao WR, Liu JC, Cheng TH
- 6770** Effects of atrial septal defects on the cardiac conduction system
Kang JH, Wu HY, Long WJ
- 6775** Periodontitis and chronic kidney disease: A bidirectional relationship based on inflammation and oxidative stress
Martínez Nieto M, De Leon Rodríguez ML, Anaya Macías RDC, Lomeli Martínez SM
- 6782** Cytokine release syndrome induced by anti-programmed death-1 treatment in a psoriasis patient: A dark side of immune checkpoint inhibitors
Maldonado-García JL, Fragozo A, Pavón L

REVIEW

- 6791** Acellular dermal matrices in reconstructive surgery; history, current implications and future perspectives for surgeons
Dilek ÖF, Sevim KZ, Dilek ON

ORIGINAL ARTICLE**Retrospective Study**

- 6808** Comprehensive epidemiological assessment of trauma incidents at a level I trauma center
Su ZY, Wei H, Wang WN, Lin YF, He YL, Liu Y, Lin RB, Liu YT, Michael N

SYSTEMATIC REVIEWS

- 6815** Gut microbiota changes associated with frailty in older adults: A systematic review of observational studies
Wen NN, Sun LW, Geng Q, Zheng GH

CASE REPORT

- 6826** *psk1* virulence gene-induced pulmonary and systemic tuberculosis in a young woman with normal immune function: A case report
Wu F, Yang B, Xiao Y, Ren LL, Chen HY, Hu XL, Pan YY, Chen YS, Li HR
- 6834** Rare primary gastric peripheral T-cell lymphoma not otherwise specified: A case report
Jang HR, Lee K, Lim KH
- 6840** Cat scratch disease in children with nocturnal fever: A case report
Yin QL, Liu YQ, Zhang HM, Zhang YL, Qi SM, Wen JQ, Zhang WH

LETTER TO THE EDITOR

- 6848** Understanding network meta-analysis
Au SCL
- 6851** Effects of foot reflexology on disease
He MY, Ud Din MJ, Xu HF, Wang SY, Ying GH, Qian H, Wu B, Qi HD, Wang X, Zhang G
- 6855** Clinical landscape and treatment of acute non-variceal upper gastrointestinal bleeding: Insights from a high-volume center in Shaanxi, China
Improta L
- 6859** Role of high-dose amoxicillin dual therapy for *Helicobacter pylori* eradication in an Irish cohort: A prospective study
Palmirotta R, Cafiero C, Colella M

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Advancing oral cancer care: Insights from Tongluo Jiedu prescription

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Abstract

This editorial highlights the study which investigated the potential of traditional Chinese medicine (TCM) as an adjunctive therapy in oral cancer management. The study included 80 patients with oral cancer to evaluate the effects of the Tongluo Jiedu prescription on inflammatory stress markers, peripheral blood T-cell subsets, and overall immune function. The results indicated that Tongluo Jiedu substantially enhances immune function and reduces oxidative stress, thereby aiding in patient recovery and potentially minimizing treatment-related complications. This editorial discusses the broader implications of these findings for oral cancer care and emphasizes the importance of integrating TCM principles into modern oncology practices.

Key Words: Tongluo Jiedu prescription; Oral cancer patients; Immune function; Oxidative stress; Traditional Chinese medicine; Adjunctive therapy

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Core Tip: The study provides valuable insights into the effectiveness of the Tongluo Jiedu prescription as an adjunctive therapy in oral cancer management. By prospectively evaluating immune function and oxidative stress levels in patients with oral cancer receiving Tongluo Jiedu prescription alongside conventional chemotherapy, the study highlighted the potential of traditional Chinese medicine in enhancing patient outcomes. The findings suggest that the Tongluo Jiedu prescription could be a valuable complementary approach to reduce treatment-related complications and accelerate recovery in oral cancer care.

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INTRODUCTION

Oral cancer is a major challenge in oncology, adversely affecting patients' health and quality of life. Although advances in conventional therapies such as surgery, chemotherapy, and radiation therapy have been made, managing oral cancer remains challenging owing to high recurrence rates, adverse effects, and treatment-related complications. These challenges highlight the need for complementary therapeutic approaches to enhance outcomes and reduce the treatment burden on patients. Traditional Chinese medicine (TCM) represents one such approach; it offers a holistic treatment philosophy based on centuries-old practices. TCM has gained increasing attention in oncology because of its potential to support conventional cancer therapies by mitigating side effects, enhancing immune function, and reducing oxidative stress, all of which are crucial for improving clinical outcomes. Among the various TCM formulations, the Tongluo Jiedu prescription has demonstrated considerable promise in cancer treatment. Recent studies have reported the diverse benefits of Tongluo Jiedu in cancer care. For example, Hui *et al*[1] demonstrated that Tongluo Jiedu can reduce myocardial fibrosis, a common complication in patients with cancer, by inhibiting the transforming growth factor- β 1 (TGF- β 1)/Smad2/3 signaling pathway. This finding suggests that Tongluo Jiedu may not only aid in cancer treatment but also protect against cardiovascular complications, thereby enhancing overall patient outcomes. In addition, studies have investigated the effects of Tongluo Jiedu on immune function and oxidative stress in patients with oral cancer and observed substantial improvements. For example, Yin *et al*[2] reported that Tongluo Jiedu modulates immune responses and reduces oxidative stress markers, which are crucial for managing the inflammatory environment associated with cancer. This immunomodulatory effect is particularly vital in oral cancer, where the tumor microenvironment considerably affects disease progression and treatment response. In addition to exploring its direct effects on oral cancer, other studies have examined the broader implications of Tongluo Jiedu in oncology. Zhang *et al*[3] investigated the Jiedu Tongluo Tiaogan Formula, a variant of the Tongluo Jiedu prescription, and determined that it protects pancreatic β cells by inhibiting endoplasmic reticulum stress and excessive autophagy through the calcium/calmodulin-dependent protein kinase kinase beta (CaMKK β)/adenosine monophosphate activated protein kinase (AMPK) pathway. Although this study focused on a different cancer type, it highlights the potential systemic benefits of Tongluo Jiedu and its derivatives in managing cancer-related complications. Incorporating Tongluo Jiedu into oral cancer therapy offers a promising approach to enhance patient outcomes. By addressing both the direct effects of cancer and the complications and side effects of conventional treatments, Tongluo Jiedu supports the growing focus on patient-centered care in oncology. This strategy enhances not only treatment effectiveness but also patients' overall quality of life. Although oral cancer poses substantial challenges, incorporating TCM, particularly the Tongluo Jiedu prescription, into treatment regimens can serve as a complementary strategy to enhance therapeutic efficacy and reduce treatment-related burdens. Ongoing research into the mechanisms and benefits of Tongluo Jiedu has indicated its potential as a valuable addition to the multidisciplinary management of oral cancer.

KEY FINDINGS

Yin *et al*[2] conducted a prospective study involving 80 patients with oral cancer to evaluate the effectiveness of the Tongluo Jiedu prescription as an adjunct to conventional chemotherapy. They examined inflammatory stress markers, peripheral blood T-cell subsets, and overall immune function. Their results revealed that patients treated with Tongluo Jiedu exhibited substantial improvements in immune function and a reduction in oxidative stress compared with controls. These findings suggest that Tongluo Jiedu plays a crucial role in counteracting chemotherapy-induced immunosuppression and oxidative stress, which are critical challenges in cancer treatment. The immunomodulatory effects observed in this study are consistent with those noted in other studies on Tongluo Jiedu therapies. For example, Huotan Jiedu Tongluo Decoction, another formulation within this category, has been reported to effectively alleviate myocardial fibrosis, reduce inflammation, and prevent tissue fibrosis[4]. Furthermore, the Jiedu Tongluo Baoshen formula, which can inhibit the phosphoinositide 3-kinase (PI3K)/protein kinase B (AKT)/mammalian target of rapamycin (mTOR) signaling pathway in diabetic kidney disease, can protect against cellular stress and damage, indicating the antioxidant property of Tongluo Jiedu[5]. In addition, Zhang *et al*[3] reported that Tongluo Jiedu formulas can protect pancreatic β cells by modulating the CaMKK β /AMPK pathway, a key player in managing metabolic stress. Although these findings have

been obtained from studies on different health conditions, they collectively demonstrate the broad therapeutic potential of the Tongluo Jiedu prescription in managing oxidative stress and immune dysfunction in various diseases, including cancer. Specifically, the improvements in immune function and the reduction in oxidative stress observed in the study by Yin *et al*[2] add to the growing body of evidence supporting Tongluo Jiedu as a valuable adjunctive therapy in oncology. By enhancing immune response and mitigating oxidative stress, Tongluo Jiedu can substantially improve cancer treatment outcomes and reduce the risk of complications associated with conventional therapies. These findings are consistent with those of other studies that have confirmed the efficacy of Tongluo Jiedu-based therapies in modulating immune function and managing oxidative stress and inflammation in various clinical settings.

ASSESSING LIMITATIONS AND FUTURE DIRECTIONS FOR ENHANCING EFFICACY AND SAFETY OF TONGLUO JIEDU IN CANCER TREATMENT

Although findings related to the Tongluo Jiedu prescription are promising, several critical limitations and future directions must be addressed. These TCM formulations have demonstrated potential in various therapeutic areas, such as inhibiting myocardial fibrosis and enhancing immune function. However, the precise mechanisms through which Tongluo Jiedu exerts its effects, particularly in cancer, remain unclear. A major limitation is the lack of comprehensive mechanistic studies. Although Tongluo Jiedu has been reported to affect TGF- β 1/Smad2/3 and CaMKK β /AMPK pathways, which are relevant in conditions such as myocardial fibrosis and pancreatic β -cell protection, these pathways have not been thoroughly examined in the context of cancer[1,3]. For example, the potential role of Tongluo Jiedu in modulating cancer-related pathways, such as the Akt1-related C-X-C motif chemokine ligand 12/C-X-C chemokine receptor type 4 axis and the sirtuin 1/liver kinase β 1/AMPK pathways, requires further exploration[6,7]. These pathways are crucial in regulating cancer cell proliferation, migration, and survival. Understanding how Tongluo Jiedu interacts with these pathways could provide valuable insights into its anticancer potential. Another critical area for further research is the variability in the efficacy of Tongluo Jiedu across different cancer types and stages. Current studies have mainly focused on specific cancers, such as oral and pancreatic cancers, limiting the generalizability of their findings. For instance, although studies have indicated that Tongluo Jiedu can affect immune function and oxidative stress in oral cancer, similar investigations are lacking for other cancer types[2]. This highlights the need for broader clinical trials to evaluate the effectiveness of Tongluo Jiedu across various cancer types. In addition, no study has examined the stage-specific efficacy of Tongluo Jiedu, which is essential for understanding its potential role in early *vs* advanced stages of cancer. Moreover, safety concerns present a substantial challenge. Although preclinical studies have reported that Tongluo Jiedu is generally safe, clinical data on its long-term safety profile, particularly concerning renal and cardiac health, are limited. The potential for adverse interactions with conventional cancer therapies is another area of concern. For example, although Tongluo Jiedu can modulate pathways involved in myocardial fibrosis and pancreatic β -cell protection, these same pathways could interact with cancer therapies in unpredictable ways, leading to therapeutic conflicts[1,3]. Furthermore, the effect of Tongluo Jiedu on the protein kinase RNA-like endoplasmic reticulum kinase-eukaryotic initiation factor 2 α -activating transcription factor 4 and autophagy pathways, which are implicated in carotid artery intimal hyperplasia, requires careful monitoring in patients with cancer to prevent unintended complications[8]. To address these limitations, future studies should focus on several key areas. First, in-depth mechanistic studies are necessary to clarify how Tongluo Jiedu interacts with both the known molecular pathways related to cancer and other pathways that may contribute to cancer progression and treatment resistance. Understanding these interactions is crucial for optimizing the integration of Tongluo Jiedu with conventional cancer therapies, potentially enhancing therapeutic outcomes while reducing risks. Second, large-scale, multicenter clinical trials should be conducted to determine the efficacy and safety of Tongluo Jiedu in various types and stages of cancer. These trials should include diverse populations to address variability in treatment responses, which is essential for the broader application of Tongluo Jiedu in cancer care. Additionally, long-term safety monitoring is necessary to track potential adverse effects, particularly in patients with preexisting conditions, such as renal or cardiac diseases. This monitoring can provide valuable insights into any contraindications or necessary adjustments to the formula. Finally, additional studies on the pharmacokinetics and pharmacodynamics of Tongluo Jiedu are essential to determine optimal dosing regimens and minimize adverse effects. These studies can help refine the use of Tongluo Jiedu in clinical settings, ensuring its safe and effective integration into cancer treatment protocols. In summary, although the Tongluo Jiedu prescription is promising as a complementary approach in cancer treatment, substantial challenges remain. Addressing these limitations through rigorous research is crucial to enhance the efficacy and safety of Tongluo Jiedu, ultimately improving outcomes for patients with cancer.

INTEGRATING SUPPORTIVE THERAPIES AND PSYCHOTHERAPY: IMPROVING QUALITY OF LIFE IN CANCER CARE

Patients with cancer experience considerable physical, emotional, and psychological challenges that adversely affect their quality of life. To address these complex challenges, integrating supportive therapies with psychotherapy has become increasingly vital in cancer care. This holistic approach not only targets the physical symptoms of cancer but also addresses the emotional and psychological well-being of patients. Among supportive therapies, TCM formulations such as Tongluo Jiedu have gained prominence for their role in managing cancer-related symptoms and improving patient outcomes. TCM formulations exert anti-inflammatory and immunomodulatory effects, which are particularly beneficial

in mitigating the adverse effects of cancer treatments. For example, Jiedu Tongluo Decoction can ameliorate myocardial fibrosis by inhibiting the TGF- β 1/Smad2/3 pathway, rendering it an essential tool in managing cardiac complications associated with cancer therapies[1]. Moreover, these formulations have demonstrated efficacy in modulating immune function and reducing oxidative stress, as evidenced by their use in patients with oral cancer to enhance overall resilience during treatment[2]. For instance, the Tiaogan Formula protects pancreatic β cells by inhibiting endoplasmic reticulum stress and excessive autophagy through the CaMKK β /AMPK pathway, which could be particularly beneficial for patients with both cancer and diabetes[3]. These findings indicate the potential of TCM not only in managing the primary symptoms of cancer but also in addressing secondary complications that may result from its treatment.

Integrating psychotherapy, particularly cognitive behavioral therapy (CBT), with supportive therapies is a comprehensive approach to cancer care. CBT can effectively alleviate depression and anxiety, which are commonly experienced by patients with cancer and can severely affect their quality of life. For instance, in patients with locoregional advanced nasopharyngeal carcinoma, CBT was reported to considerably improve psychological well-being and reduce adverse emotional reactions to the disease[9]. This finding demonstrates the importance of addressing mental health as a key component of holistic cancer care. Moreover, psychotherapeutic interventions extend beyond traditional talk therapy. Creative modalities, such as art therapy, can reduce fatigue and enhance the quality of life in patients with breast cancer, highlighting the value of integrating diverse therapeutic approaches[10]. This multifaceted strategy not only alleviates physical symptoms but also fosters emotional resilience and a sense of empowerment, which are crucial for the overall well-being of patients with cancer. Integrating supportive therapies, such as Tongluo Jiedu, with psychotherapeutic interventions represents a substantial shift toward a more holistic approach to cancer care. This strategy not only targets the physical aspects of cancer but also addresses the emotional and psychological challenges that are often associated with the disease. By enhancing overall quality of life, this combined approach ensures that cancer care is more patient-centered and comprehensive. As cancer treatment becomes increasingly complex, with more patients living longer, the emphasis on quality of life has become crucial. The integration of supportive therapies and psychotherapy is thus essential to achieving this goal, ensuring that cancer care transcends mere survival to help patients live well despite the disease. Incorporating these therapies into cancer treatment provides a more holistic approach that substantially improves patient outcomes by addressing both the physical and psychological aspects of cancer. As ongoing research continues to validate the effectiveness of these therapies, their role in cancer care is likely to grow, offering hope and a better quality of life to those facing this challenging illness.

DISCUSSION

The integration of TCM principles into modern cancer care represents an evolving approach that complements conventional oncology with holistic strategies. A key example is the Tongluo Jiedu prescription, a traditional remedy designed to target the underlying mechanisms of oral cancer. This prescription aims to enhance the collateral circulation, promote detoxification, and modulate immune function, thus addressing immune suppression and oxidative stress that are often exacerbated by conventional treatments such as chemotherapy and radiation therapy. Yin *et al*[2] provided evidence that incorporating the Tongluo Jiedu prescription into standard chemotherapy regimens considerably enhances immune function and reduces oxidative stress in patients with oral cancer. This enhancement in immune function is particularly crucial because it helps counteract the immunosuppressive effects of both cancer and its treatments. Key components of the prescription, such as *Scutellaria baicalensis* and *Panax ginseng*, increase the activity of natural killer cells, T cells, and macrophages, thereby improving the body's ability to identify and destroy cancer cells. Moreover, the prescription's effectiveness in reducing oxidative stress, a major factor in cancer progression, indicates its therapeutic potential. Oxidative stress results from an imbalance between free radicals and antioxidants, leading to cellular damage. Herbs such as *Astragalus membranaceus* and *Ligusticum chuanxiong*, which are rich in antioxidants, scavenge free radicals, thereby protecting cells from oxidative damage and helping to stabilize the patient's condition by maintaining cellular integrity [2]. These findings are particularly relevant given the challenges posed by chemotherapy-induced immunosuppression and oxidative stress, both of which adversely affect patient outcomes. The ability of Tongluo Jiedu to enhance immune resilience and mitigate oxidative damage suggests its potential as an adjunctive therapy, which can alleviate some of the adverse effects associated with conventional cancer treatments[1]. Additional insights into the prescription's mechanisms reveal its ability to modulate key signaling pathways involved in cancer progression. For example, certain components of Tongluo Jiedu inhibit the PI3K/Akt/mTOR pathway, which drives tumor growth and metastasis. This pathway is commonly upregulated in various cancers, including oral cancer, leading to increased cell proliferation and survival[5]. By targeting the PI3K/Akt/mTOR pathway, Tongluo Jiedu not only impedes tumor growth but also enhances the effectiveness of other therapeutic interventions. In addition, studies on related TCM formulations, such as the Jiedu Tongluo Tiaogan formula, have demonstrated that it protects cells from damage by inhibiting endoplasmic reticulum stress and excessive autophagy through the CaMKK β /AMPK pathway[3]. These findings suggest the involvement of similar mechanisms in oral cancer, where oxidative stress and inflammation are critical factors in disease progression and treatment resistance. The increasing incidence of chemotherapy-related complications highlights the urgent need for effective therapies with fewer risks. The Tongluo Jiedu prescription offers a promising solution by enhancing immune function and reducing oxidative stress without introducing substantial toxicity. This approach aligns with the evolving focus in oncology on patient-centered care and holistic treatment strategies[8]. From a formulary perspective, the Tongluo Jiedu prescription is carefully developed by combining herbs based on a comprehensive understanding of their individual and synergistic effects. This balanced formulation addresses multiple aspects of cancer pathology, adhering to the TCM principle of restoring bodily balance instead of merely targeting the disease or its symptoms[11]. Overall, the

Tongluo Jiedu prescription represents a comprehensive approach to managing oral cancer; it has the capacity to modulate immune responses, reduce oxidative stress, and affect key signaling pathways. Its integration into modern cancer care not only supports the shift toward more holistic treatment approaches but also holds considerable potential to improve patient outcomes and quality of life. Future research should focus on further elucidating the molecular mechanisms underlying the therapeutic effects of Tongluo Jiedu and exploring its role as a complementary therapy in oral cancer management[2].

CONCLUSION

The study by Yin *et al*[2] represents a pivotal advancement in the exploration of adjuvant therapies for oral cancer, particularly through the use of the Tongluo Jiedu prescription. This study contributes to the growing body of evidence suggesting that Tongluo Jiedu could substantially enhance treatment efficacy for patients with oral cancer. Recent studies, including that by Yin *et al*[2], have highlighted the benefits of Tongluo Jiedu in various medical contexts, further supporting its potential in integrative oncology. Yin *et al*[2] demonstrated that Tongluo Jiedu improves immune function and reduces oxidative stress in patients with oral cancer, addressing immune suppression and oxidative damage that are commonly associated with cancer treatments. These improvements in immune response and oxidative stress are vital for improving overall treatment outcomes and patients' quality of life. In addition, Hui *et al*[1] reported that Tongluo Jiedu can attenuate myocardial fibrosis through the TGF- β 1/Smad2/3 pathway, indicating its ability to mitigate fibrotic complications often linked to cancer therapies. Such findings highlight the broader therapeutic potential of Tongluo Jiedu beyond oncology; this thus indicates its ability to manage treatment-related side effects and improve patient resilience. Furthermore, Zhang *et al*[3] elucidated that Tongluo Jiedu can protect cells by inhibiting endoplasmic reticulum stress and excessive autophagy, which are often triggered by aggressive cancer treatments. By modulating key molecular pathways, such as the CaMKK β /AMPK pathway, Tongluo Jiedu can help reduce the toxicity of conventional cancer therapies, thereby preserving healthy tissues and improving patient outcomes. In conclusion, integrating Tongluo Jiedu with conventional cancer treatments presents a promising approach to enhance therapeutic efficacy while minimizing adverse effects. The ability of Tongluo Jiedu to modulate critical biological pathways, such as the PI3K/Akt/mTOR signaling pathway, as demonstrated by Jin *et al*[5], supports its potential in cancer management by promoting autophagy and reducing tumor growth. This integrative approach is an innovative therapeutic strategy that can improve patient outcomes. However, as with any integrative therapy, closely monitoring patients for potential side effects, such as gastrointestinal discomfort or allergic reactions, is crucial. The safety profile of Tongluo Jiedu must be thoroughly evaluated for different cancer types and stages, and its interactions with other treatments should be carefully considered in clinical practice. Ongoing research and clinical trials are essential to fully realize the benefits of Tongluo Jiedu in oncology, ensuring its safe and effective integration into standard cancer care practices globally.

FOOTNOTES

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