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1. [**Effects of auricular acupressure on chemotherapy-induced nausea and vomiting in breast cancer patients: a preliminary randomized controlled trial**](#)

Authors

[Jing-Yu Tan](#) [1] [2], [Alex Molassiotis](#) [3], [Lorna K P Suen](#) [3] [4], [Jian Liu](#) [5], [Tao Wang](#) [3] [6] [7], [Hui-Rong Huang](#) [8]

Abstract

Background: Auricular acupressure (AA) has been viewed as a promising approach to managing chemotherapy-induced nausea and vomiting (CINV) but relevant research evidence has been inconclusive. This study aimed to examine the effects of AA on CINV in breast cancer (BC) patients undergoing chemotherapy.

Methods: A preliminary randomized controlled trial was conducted in 114 BC patients. Participants were randomly allocated to a true AA group (n = 38), a sham AA group (n = 38), and a standard care group (n = 38). All the participants were provided with standard antiemetic treatment and care, while the true AA group and the sham AA group received an additional 5-day true AA and a 5-day sham AA, respectively. Acute and delayed CINV were assessed by using the MASCC Antiemesis Tool (MAT), anticipatory nausea and vomiting were measured by the Index of Nausea, Vomiting, and Retching (INVR), and patients' quality of life (QoL) was evaluated by the Functional Assessment of Cancer Therapy-Breast (FACT-B).

Results: Both the true and sham AA groups reported improved CINV outcomes than the standard care group, with the true AA demonstrating larger effects than the sham comparison. The true and sham AA groups had higher complete response (CR) rates of CINV when compared with the standard care group, with the difference in the CR of acute CINV achieving statistical significance (p = 0.03). Both the true and sham AA groups demonstrated lower incidence and severity of acute CINV compared with the standard care group with the among-group difference reaching statistical significance for the occurrence (p = 0.04) and severity (p = 0.001) of acute nausea. No significant differences in anticipatory CINV and QoL were found among the groups.

Conclusion: The use of AA plus standard antiemetic treatment and care was superior to the use of standard antiemetic treatment and care alone in managing CINV among BC patients receiving chemotherapy. The antiemetic effects of AA were identified to be more profound in improving acute CINV, particularly acute nausea. The antiemetic effects of AA were deemed to be a mixture of specific treatment effects and placebo effects, and the placebo effects were very large and even reached clinical significance.

Trial registration: ClinicalTrials.gov; [NCT02403037](#) ; Registered March 31, 2015.

2. [**Electroacupuncture for treating cancer-related insomnia: a multicenter, assessor-blinded, randomized controlled, pilot clinical trial**](#)

Authors

[Boram Lee](#) [# 1] , [Bo-Kyung Kim](#) [# 2] , [Mikyung Kim](#) [3] , [Ae-Ran Kim](#) [1] , [Hyo-Ju Park](#) [1] , [O-Jin Kwon](#) [1] , [Jun-Hwan Lee](#) [1] [4] , [Joo-Hee Kim](#) [5] [6]

Abstract

Background: Insomnia is one of the most frequent symptoms in people with cancer. Electroacupuncture has been widely used in people with cancer or insomnia. We explored the feasibility and preliminary effectiveness of electroacupuncture for cancer-related insomnia.

Methods: People with cancer and insomnia disorder were randomly allocated to electroacupuncture, sham-electroacupuncture, or usual care groups. Participants received either 10 sessions of electroacupuncture at real acupoints, sham-electroacupuncture at non-acupoints, or usual care in each group for 4 weeks. We calculated the recruitment, adherence, and completion rates of participants. The Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI), sleep diary and actigraphy-derived sleep parameters, Functional Assessment of Cancer Therapy-Fatigue (FACT-F), Montreal Cognitive Assessment (MoCA), and salivary levels of cortisol and melatonin were evaluated as outcome measures.

Results: Twenty-two participants were enrolled (8, 6, and 8 respectively in the electroacupuncture, sham-electroacupuncture, and usual care groups) and 20 participants completed the trials (8, 4, and 8 respectively). The recruitment, adherence, and completion rates were 78.57% (22/28), 95.45% (21/22), and 90.91% (20/22), respectively. Most of the participants had previously received conventional treatment for insomnia, but few had received Korean medicine treatment, without any demographic or clinical differences between groups. In the electroacupuncture group, there was a statistically significant reduction of 10.13 (mean) ± 8.15 (standard deviation) and 5 ± 3.70 points in mean ISI and PSQI scores at 4 weeks post-treatment (P = .0098 and .0066), compared with sham-electroacupuncture (2.06 ± 7.15 and 1.61 ± 4.34; P = .4796 and .3632) and usual care (3.25 ± 2.60 and 1.38 ± 2.13; P = .0096 and .1112). Although there was no significant difference in ISI score between groups at 4 weeks post-treatment, the electroacupuncture group continued to improve significantly at 4 weeks' follow-up, showing borderline and significant differences compared to the sham-electroacupuncture and usual care (P = .0614 and .0015). The FACT-F scores in electroacupuncture group showed a significant improvement compared with the sham-electroacupuncture group (P = .0305). No electroacupuncture-related adverse events were reported.

Conclusions: Electroacupuncture might be feasible for cancer-related insomnia, despite slow participant recruitment. Additional trials with adequately powered sample sizes and a substantial change to the recruitment procedure are needed.

Trial registration: Clinical Research Information Service, KCT0002162 . Submitted 27 October 2016, Registered 2 December 2016 - Retrospectively registered (The first participant enrolment: 28 November 2016).

3. **[Electro-acupuncture for protracted amphetamine abstinence syndrome: study protocol for a pragmatic randomized controlled trial](#)**

Authors

[Huan Ren](#) [1] , [Yiwei Zeng](#) [1] , [Min Zhang](#) [1] , [Su Zhang](#) [1] , [Zhihan Chen](#) [1] , [Binbin Wu](#) [2] , [Jun Liu](#) [3] , [Yulan Ren](#) [4]

Abstract

Background: Protracted amphetamine abstinence syndrome is one of the primary causes of relapse for amphetamine-type drug abusers during withdrawal. However, the importance of the management of protracted amphetamine abstinence syndrome is underestimated. Electro-acupuncture may be a safe and effective alternative therapy for protracted amphetamine abstinence syndrome, but the evidence is limited.

Methods: The study is a prospective, two-center, randomized, waitlist controlled, open-label pragmatic trial. A total of 300 patients with protracted amphetamine abstinence syndrome will be recruited. All participants will be randomly assigned to an electro-acupuncture group or a waitlist group in a 1:1 ratio. Participants in the electro-acupuncture group will receive the electrical-acupuncture treatment. Waitlist group participants will not receive electro-acupuncture treatment but will be assessed at each visit. Treatments will be administered twice a week for a total of 4 consecutive weeks. The primary outcome in this study is the change in the ACSA between baseline (week 0) and the completion of treatment (week 4), and the secondary outcomes are changes in the Hamilton Depression Scale (HAMD), the visual analog scale (VAS), the Hamilton Anxiety Scale (HAMA), the Pittsburgh Sleep Quality Index (PSQI), the Montreal Cognitive Assessment (MoCA), and the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36).

Discussion: This study will assess the effectiveness of acupuncture in PAAS in real-world settings to provide support for clinical decisions and a basis for subsequent trials comparing acupuncture with other positive regimens.

4. [**Traditional and complementary medicine use among cancer patients in Nepal: a cross-sectional survey**](#)

Authors

[Soo Jeung Choi](#) [1] [2], [Sangita Karki Kunwor](#) [1] [2], [Hyea Bin Im](#) [1] [2], [Jung Hye Hwang](#) [2] [3], [Dain Choi](#) [1] [2], [Dongwoon Han](#) [4] [5] [6]

Abstract

Background: Traditional and complementary medicine (T&CM) is commonly used in South Asian countries such as Nepal. There are various causes and contributing factors for patients with cancer to consider using T&CM. However, little is known about the use of T&CM among the cancer population in this region.

Methods: The study followed a cross-sectional design using a structured survey questionnaire. Survey participants were recruited from two National hospitals in Kathmandu, Nepal. The survey instrument comprised 30 questions, including variables on demographics, use of T&CM, and perceived level of disease severity, and cancer treatment. Chi-square test and logistic regression were used for data analysis using SPSS ver. 23.0.

Results: Of 908 participants, 31.6% used one or more modalities of T&CM after a cancer diagnosis. The most commonly used T&CM was Ayurveda (46.5%), followed by yoga (32.4%). About 46% of T&CM users discussed their use with their doctors. The main source of information on T&CM was their family members and relatives (55.7%). Cancer type (head and neck cancer OR: 2.30, CI: 1.23-4.29; abdominal cancer OR: 2.69, CI: 1.47-4.95; lung cancer OR: 5.88, CI: 2.69-12.89), cancer stage (Stage I OR: 1.92, CI: 1.14-3.25; Stage II OR: 1.76, CI: 1.06-2.94), and the patients' self-rated disease severity (high perceived severity OR: 1.50, CI: 1.05-2.16) were strong predictors of T&CM use.

Conclusion: This study underlined that despite the widespread use of T&CM among cancer patients in Nepal, most patients obtained information on T&CM from informal sources and did not disclose their use to physicians. To ensure the safe use of T&CM modalities, physicians should integrate questions on T&CM use into routine patient assessments in order to facilitate active communication and improve the quality of care.

5. [**An ethnobotanical survey of medicinal plants used by traditional healers for the treatment of cancer in Hammanskraal and Winterveld, Tshwane Metropolitan Municipality, South Africa**](#)

Authors

Idris O Raimi [1] , Boikanyo G Kopaopa [1] , Liziwe L Mugivhisa [1] , Francis B Lewu [2] , Stephen O Amoo [3] , Joshua O Olowoyo [1]

Abstract

Background: Knowledge of medicinal plants used by the traditional healers are mostly confined among the locals and the adherents, hence, proper enquiry and documentation can help the ever dynamic scientific world to find permanent cure to the menace of such deadly diseases such as cancer. This study aimed at (1) specifically recording medicinal plants traditionally used for the treatment of cancer in Hammanskraal and Winterveld, South Africa, and (2) documenting the different methods of preparation and administration of those medicinal plants as recorded during the study.

Method: An open-ended semi-structured questionnaire was administered to 90 willing traditional healers in Hammanskraal and Winterveld area, Tshwane Municipality, South Africa to document plants used for cancer treatments. The study was conducted over a period of six months (July - December, 2018). Descriptive statistics was used to present the obtained data.

Results: The study recorded twenty-eight plant species belonging to 18 families for the treatment of different types of cancer. Plant species in the Fabaceae family particularly *Lessertia frutescens* (L.) Goldblatt and J.C. Manning, *Senna italica* Mill and *Trifolium pratense* L. were the most prominently mentioned (highest citation frequency) by the traditional healers for lung, and skin cancer treatment. Based on the citation frequency, the most treated cancer by the traditional healers is in the order: skin cancer > lung cancer > breast cancer > prostate cancer > cervical cancer. The method of preparation included decoction (32.3%), infusion (29%), paste (16.1%) and maceration (22.6%).

Conclusion: In addition to the documentation of indigenous knowledge related to the use of medicinal plants in the traditional management of cancer in South Africa, this study opens a vista for investigations into the phytochemical and pharmacological properties of the documented plants.

6. **Herbals and Plants in the Treatment of Pancreatic Cancer: A Systematic Review of Experimental and Clinical Studies**

Authors

John K Triantafillidis [1] [2], Eleni Triantafyllidi [2], Michail Sideris [3], Theodoros Pittaras [4], Apostolos E Papalois [2] [5]

Abstract

Background: Pancreatic cancer represents the most lethal malignancy among all digestive cancers. Despite the therapeutic advances achieved during recent years, the prognosis of this neoplasm remains disappointing. An enormous amount of experimental (mainly) and clinical research has recently emerged referring to the effectiveness of various plants administered either alone or in combination with chemotherapeutic agents. Apart from Asian countries, the use of these plants and herbals in the treatment of digestive cancer is also increasing in a number of Western countries as well. The aim of this study is to review the available literature regarding the efficacy of plants and herbals in pancreatic cancer.

Methods: The authors have reviewed all the experimental and clinical studies published in Medline and Embase, up to June 2021.

Results: More than 100 plants and herbals were thoroughly investigated. Favorable effects concerning the inhibition of cancer cell lines in the experimental studies and a favorable clinical outcome after combining various plants with established chemotherapeutic agents were observed. These herbals and plants exerted their activity against pancreatic cancer via a number of mechanisms. The number and severity of side-effects are generally of a mild degree.

Conclusion: A quite high number of clinical and experimental studies confirmed the beneficial effect of many plants and herbals in pancreatic cancer. More large, double-blind clinical studies assessing these natural products, either alone or in combination with chemotherapeutic agents should be conducted.

7. **Alternative medicine: therapeutic effects on gastric original signet ring carcinoma via ascorbate and combination with sodium alpha lipoate**

Authors

Weiyu Chen [1] [2] [3], Lingyun Xu [4] [5], Edwin Chang [4] [5], Gayatri Gowrishankar [4] [6], Katherine W Ferrara [7] [8] [9], Sanjiv Sam Gambhir [4] [6] [5] [10] [11] [12]

Abstract

Background: Gastric signet ring cell carcinoma (SRCC) is an aggressive gastric adenocarcinoma with a poor prognosis when diagnosed at an advanced stage. As alternative medicine, two

natural supplements (ascorbate (AA) and sodium alpha lipoate (LA)) have been shown to inhibit various cancers with mild side effects.

Methods: These two natural supplements and a series of combinations (AA&LA, AA+LA and LA + AA) were incubated with non-SRCC cells (GPM-1), patient-derived gastric origin SRCC (GPM-2), gastric-origin SRCCs (HSC-39 and KATO-3), human pancreatic (MIA PaCa-2) and ovarian (SKOV-3) cells for evaluating their therapeutic effects. Moreover, these treatments were applied in 3D-cultured organoids to reveal the feasibility of these approaches for in vivo study.

Results: Analyzing their antioxidant capabilities and dose-response curves, we observed that all four gastric cell lines, including three patient-derived cell lines were sensitive to ascorbate (~ 10 mM). The influence of ascorbate incubation time was studied, with a 16-h incubation found to be optimal for in vitro studies. Moreover, a simultaneous combination of AA and LA (AA&LA) did not significantly inhibit cell proliferation, while prior LA treatment increased the growth inhibition of AA therapy (LA + AA). Anti-cancer efficacy of AA was further confirmed in 3D-cultured SRCC (KATO-3) organoids.

Conclusions: This study highlights the potential of AA and LA + AA in treating gastric origin SRCC, and demonstrates the influence of order in which the drugs are administered.

8. [**Current research status of alkaloids against breast cancer**](#)

Authors

[Zhiqiang Hu](#) [1] , [Jingling Pan](#) [1] , [Jialing Wang](#) [2] , [Yanmin Pei](#) [2] , [Ru Zhou](#) [3]

Abstract

Breast cancer is one of the most common malignant tumors in women worldwide. Surgery, chemotherapy, and targeted drugs are the main methods currently used in clinical treatment of breast cancer. Although they can improve the symptoms of patients, they are also accompanied by a large number of side effects. Because of its multiple targets, traditional Chinese medicine can improve the quality of life of breast cancer patients and reduce the side effects associated with chemotherapy, which plays an important role in the treatment of breast cancer. To a certain extent, traditional Chinese medicine has advantages that modern medicine does not have in the treatment of breast cancer. Alkaloids are active ingredients widely distributed in traditional Chinese medicine, which have a variety of pharmacological effects including anti-inflammatory, analgesic, and antitumor effects. The author reviewed the literature on the treatment of breast cancer with alkaloids extracted from traditional Chinese medicine in recent years, and discussed the unique advantages of alkaloids in the treatment of breast cancer.

9. **[Polyacetylenes from *Codonopsis lanceolata* Root Induced Apoptosis of Human Lung Adenocarcinoma Cells and Improved Lung Dysbiosis](#)**

Authors

[Meng-Chuan Wang](#) [1], [Yu-Fang Wu](#) [2], [Wen-Ying Yu](#) [1], [Bing Yu](#) [2], [Hua-Zhong Ying](#) [1] [2]

Abstract

Codonopsis lanceolata is a perennial smelly herbaceous plant and widely employed for the treatment of various lung cancer and inflammation. However, the anticancer substances in *C. lanceolata* and their underlying mechanisms had not been well clarified. In this study, six compounds were obtained from the water extracts of *C. lanceolata* polyacetylenes (CLP) and then identified as syringin, codonopilodiynoside A, lobetyol, isolariciresinol, lobetyolin, and atractylenolide III. Treatment with CLP remarkably suppressed the cell proliferation, colony formation, migration, and invasion of A549 cells. Synergistic effects of lobetyolin and lobetyol were equivalent to the antiproliferative activities of CLP, while other compounds did not have any inhibition on the viabilities of A549 cells. CLP also reduced the expression of Ras, PI3K, p-AKT, Bcl-2, cyclin D1, and CDK4 but increased the expression of Bax, GSK-3β, clv-caspase-3, and clv-caspase-9, which could be reversed by the PI3K activator 740YP. Furthermore, CLP retarded the growths of tumor and lung pathogenic bacteria in mice. It demonstrated that lobetyolin and lobetyol were the main antitumor compounds in *C. lanceolata*. CLP induced cell apoptosis of lung cancer cells via inactivation of the Ras/PI3K/AKT pathway and ameliorated lung dysbiosis, suggesting the therapeutic potentials for treating human lung cancer.

10. **[Evaluation of the effects of Ipomoea staphylina on ovarian cancer cell line](#)**

Authors

[Lingling Xing](#) [1], [Leilei He](#) [2], [Tong Zhang](#) [3], [Haibo Ruan](#) [4], [Ying Zhang](#) [5], [Yanyui Li](#) [2], [Firdous Sayeed Mohammed](#) [6]

Abstract

Ovarine cancer is a common woman malignancy in the world. Majority of the ovarian cancers are originated in the epithelial region which are lack of symptomps and this type of cancer is often get localized, when the tumour has spread outside the pelvis. Based on this context, the present study evaluated the effects of both aqueous and ethanolic extracts of Ipomoea staphylina leaves

on ovarian cancer cell line. The SKOV-3 ovarian cancer cell line was used for evaluation of the effects of both extracts. Both extracts showed IC_{50} effects on ovarian cancer cell lines as sensitivity index (SI) for both extracts were recorded to above 1.iFurther, ethanol extract was more effective in the moderation of gene expressions of matrix metalloproteinase-2 (MMP-2) and matrix metalloproteinase-9 (MMP-9) in comparison to aqueous extract. Further, morphological changes of SKOV-3 cells after treatment with both extracts also confirmed the results. The study, therefore, concludes that the ethanolic extract of Ipomoea staphylina leaves is more effective against ovarian cancer cell line.

11. [**Anthocyanins: Traditional Uses, Structural and Functional Variations, Approaches to Increase Yields and Products' Quality, Hepatoprotection, Liver Longevity, and Commercial Products**](#)

Authors

[Hamdoon A Mohammed](#) [1] [2] , [Riaz A Khan](#) [1]

Abstract

Anthocyanins are water-soluble, colored compounds of the flavonoid class, abundantly found in the fruits, leaves, roots, and other parts of the plants. The fruit berries are prime sources and exhibit different colors. The anthocyanins utility as traditional medicament for liver protection and cure, and importance as strongest plants-based anti-oxidants have conferred these plants products different biological activities. These activities include anti-inflammation, liver protective, analgesic, and anti-cancers, which have provided the anthocyanins an immense commercial value, and has impelled their chemistry, biological activity, isolation, and quality investigations as prime focus. Methods in extraction and production of anthocyanin-based products have assumed vital economic importance. Different extraction techniques in aquatic solvents mixtures, eutectic solvents, and other chemically reactive extractions including low acid concentrations-based extractions have been developed. The prophylactic and curative therapy roles of the anthocyanins, together with no reported toxicity has offered much-needed impetus and economic benefits to these classes of compounds which are commercially available. Information retrieval from various search engines, including the PubMed®, ScienceDirect®, Scopus®, and Google Scholar®, were used in the review preparation. This imparted an outlook on the anthocyanins occurrence, roles in plants, isolation-extraction, structures, biosynthetic as well as semi- and total-synthetic pathways, product quality and yields enhancements, including uses as part of traditional medicines, and uses in liver disorders, prophylactic and therapeutic applications in liver protection and longevity, liver cancer and hepatocellular carcinoma. The review also highlights the integrated approach to yields maximizations to meet the regular demands of the anthocyanins products, also as part of the extract-rich preparations together with a listing of marketed products available for human consumption as nutraceuticals/food supplements.

12. [**Effect of Yoga on Clinical Outcomes and Quality of Life in Patients With Vasovagal Syncope (LIVE-Yoga)**](#)

Authors

Gautam Sharma [1], Venkatakrishnan Ramakumar [2], Mohd Sharique [3], Rohit Bhatia [4], Nitish Naik [2], Sriloy Mohanty [3], Aman Agarwal [3], Mohini Meti [5], Akriti Shukla [2], Siddharthan Deepti [6], Raghav Bansal [6], Anunay Gupta [7], A Shaheer Ahmed [7], R M Pandey [8], Rajiv Narang [2], Sundeep Mishra [2], Anita Saxena [2], Rajnish Juneja [2], LIVE-Yoga Investigators

Abstract

Objectives: This study aims to determine the impact of yoga as an adjunct to standard therapy versus standard therapy alone on the symptomatic burden in patients with recurrent vasovagal syncope (VVS).

Background: There is a significant reduction in the quality of life (QoL) of patients with recurrent VVS. Existing management therapies have been largely ineffective. Recent trials have demonstrated the efficacy of yoga in diseases with autonomic imbalance, suggesting its possible utility in VVS.

Methods: Patients with recurrent VVS were randomized to receive either a specialized yoga training program in addition to current guideline-based therapy (intervention arm, group 1) or current guideline-based therapy alone (control arm, group 2). The primary outcome was a composite of the number of episodes of syncope and presyncope at 12 months. Secondary outcomes included QoL assessment by World Health Organization Quality of Life Brief Field questionnaire (WHOQoL-BREF) scores and Syncope Functional Status Questionnaire scores at 12 months, head up tilt test, and heart rate variability at 6 weeks.

Results: A total of 55 patients underwent randomization. The mean number of syncopal or presyncopal events at 12 months was 0.7 ± 0.7 in the intervention arm compared to 2.52 ± 1.93 in the control arm ($P < 0.01$). In the intervention arm, 13 (43.3%) patients remained free of events versus 4 (16.0%) patients in the control arm ($P = 0.02$). QoL at 12 months showed significant improvement of all Syncope Functional Status Questionnaire scores and 2 domains of WHOQoL-BREF scores ($P < 0.05$).

Conclusions: Yoga as adjunctive therapy is superior to standard therapy alone in reducing the symptomatic burden and improving QoL in patients with recurrent VVS.

13. **Neuroprotective effect of Mulmina Mango against chemotherapy-induced cognitive decline in mouse model of mammary carcinoma**

Authors

Jeena John [1], Manas Kinra [1], Niraja Ranadive [1], Raghuvir Keni [1], Pawan Ganesh Nayak [1], Rajesh N Jagdale [2], Syed M Ahmed [2], Kaggundi V Raghavendra [2], Jayesh Mudgal [1], K Nandakumar [3]

Abstract

The post-treatment status of breast cancer survivors has become a concern because of the toxicity induced by chemotherapeutic agents in the brain tissues resulting in cognitive deficits, which is generally referred as chemobrain. The aim of this study was to assess the effect of a proprietary ayurvedic formulation Mulmina Mango against chemotherapy-induced cognitive impairment (CICI). Mammary carcinoma was induced by subcutaneously inoculating 4T1 cells into the mammary fat pad of the animals. Intraperitoneal administration of Cyclophosphamide, Methotrexate, 5-Fluorouracil (CMF) regimen was carried out once a week for three weeks. Treatment of Mulmina began one week before chemotherapy and continued till the end of the chemotherapy cycle. After three cycles of chemotherapy, cognitive decline was assessed by Morris water maze task followed by assessment of locomotor activity by open-field test. Tumor progression was evaluated by measurement of tumor volume. Oxidative and neuroinflammatory markers were also evaluated from the isolated brain samples. CMF treatment resulted in a considerable reduction in tumour volume. We found chemotherapy negatively affected behavioral and biochemical parameters in animals and Mulmina treatment ameliorated these cognitive impairments by restoring antioxidant and maintaining cytokine levels. The combination of phytochemicals in Mulmina proved its possible ability to alleviate CICI without affecting chemotherapeutic efficiency and could pave the way for identifying treatment strategies to combat chemobrain.

14. **Experimental Research on the Antitumor Effect of Human Gastric Cancer Cells Transplanted in Nude Mice Based on Deep Learning Combined with Spleen-Invigorating Chinese Medicine**

Authors

Ke Ai [1], Ding Yuan [1] [2], Jie Zheng [1]

Abstract

Gastric cancer is still the fifth most common malignant tumor in the world and has the fourth highest mortality rate in the world. Gastric cancer is difficult to treat because of its unobvious onset, low resection rate, and rapid deterioration. Therefore, humans have been working hard to combat gastric cancer. At present, the most commonly used treatment method is radiotherapy. However, this method will damage the normal tissues of the irradiated area while treating malignant tumor cells. It not only has side effects of damage to the patient's skin and mucous membranes but also needs high-rate radiotherapy and has high cost for chemotherapy. In order to solve these problems, it is necessary to find new treatment methods. This article proposes the use of Chinese medicine to invigorate the spleen to inhibit human gastric cancer cells. This article combines modern machine learning technology with traditional Chinese medicine and combines traditional Chinese medicine physiotherapy with Western medicine nude mouse transplantation experiments. The treatment of tumors in Chinese medicine is based on the theory of Chinese medicine and has different characteristics. Western medicine has the advantage of permanently injuring patients. The process of the experiment is to transplant human-derived gastric cancer cells into nude mice. After grouping treatments and obtaining comparative data, deep learning techniques are used to analyze the properties of Chinese medicines for strengthening the spleen and to compare the properties of Chinese medicines for strengthening the spleen. The experimental results showed that the tumor inhibition rate of mice using fluorouracil was 18%, the tumor inhibition rate of mice using low-dose Chinese medicine was 16%, and the tumor inhibition rate of mice using high-dose Chinese medicine reached 52%. 80 days after the experiment, the survival rate of mice using high-dose Chinese medicine is 100% higher than that of mice without treatment.

15. **Complementary medicine as a risk factor for catastrophic expenditures in people with cancer**

Author

Adovich S Rivera [1]
No abstract available

Conflict of interest statement

I receive funding from the American Heart Association on topics outside the submitted work. The American Heart Association played no role in the development of this manuscript.

Comment on

- [Out-of-pocket payments for complementary medicine following cancer and the effect on financial outcomes in middle-income countries in southeast Asia: a prospective cohort study.](#)

  Kong YC, Kimman M, Subramaniam S, Yip CH, Jan S, Aung S, Khoa MT, Ngelangel CA, Nyein HL, Sangrajrang S, Tanabodee J, Bhoo-Pathy N; ACTION Study Group.

[Neurobiological Promises of the Bitter Diterpene Lactone Andrographolide](#)

16.

Authors

[Rajib Hossain](#) [1], [Cristina Quispe](#) [2], [Jesús Herrera-Bravo](#) [3] [4], [Jorge F Beltrán](#) [5], [Muhammad Torequl Islam](#) [1], [Shabnum Shaheen](#) [6], [Natália Cruz-Martins](#) [7] [8] [9] [10], [Miquel Martorell](#) [11] [12], [Manoj Kumar](#) [13], [Javad Sharifi-Rad](#) [14], [Fethi Ahmet Ozdemir](#) [15], [William N Setzer](#) [16], [Mohammed M Alshehri](#) [17], [Daniela Calina](#) [18], [William C Cho](#) [19]

Abstract

Andrographolide (ANDRO), a bitter diterpene lactone found in *Andrographis paniculata* (Burm.f.) Nees, possesses several biological effects such as antioxidant, anti-inflammatory, and organo-protective effects. Scientific reports suggest that it also has neuroprotective capacity in various test systems. The purpose of this review was to synthesize the neuropharmacological properties of ANDRO and highlight the molecular mechanisms of action that highlight these activities. A careful search was done in PubMed and Google Scholar databases using specific keywords. Findings suggest that ANDRO possess neuroprotective, analgesic, and antifatigue effects. Prominent effects were stated on neuro-inflammation, cerebral ischemia, Alzheimer's and Parkinson's diseases, multiple sclerosis, and brain cancer in mice and rats. Furthermore, ANDRO and its derivatives can enhance memory and learning capacity in experimental animals (rats) without causing any toxicity in the brain. Thus, ANDRO may be one of the most promising plant-based psychopharmacological lead compounds for new drug development.

[Brain-computer interface as complementary therapy for hemiparesis in an astrocytoma patient](#)

17.

Authors

Ruben I Carino-Escobar [1], Marlene A Rodriguez-Barragan [2], Paul Carrillo-Mora [3], Jessica Cantillo-Negrete [4]

No abstract available

18. **Sleep moderates the effects of Tibetan yoga for women with breast cancer undergoing chemotherapy**

Authors

Kelsey L Sinclair [1], Emalee Kiser [1], Chelsea G Ratcliff [2] [3], Alejandro Chaoul [4], Martica H Hall [5], Tenzin Wangyal Rinpoche [6], Lorenzo Cohen [7]

Abstract

This study examined self-reported and actigraphy-assessed sleep and depression as moderators of the effect of a Tibetan yoga intervention on sleep and depression among women undergoing chemotherapy for breast cancer. This is a secondary analysis of an RCT examining a 4-session Tibetan yoga program (TYP; n = 74) versus stretching program (STP; n = 68) or usual care (UC; n = 85) on self-reported sleep (Pittsburgh Sleep Quality Index (PSQI), actigraphy-assessed sleep efficiency (SE)) and depression (Centers for Epidemiological Studies Depression Scale; CES-D) for women undergoing chemotherapy for breast cancer. Data were collected at baseline and 1-week and 3-month post-intervention. Baseline PSQI, actigraphy-SE, and CES-D were examined as moderators of the effect of group on PSQI, actigraphy-SE, and CES-D 1 week and 3 months after treatment. There was a significant baseline actigraphy-SE × group effect on PSQI at 1 week (p < .001) and 3 months (p = .002) and on CES-D at 3 months (p = .049). Specifically, the negative association of baseline actigraphy-SE with subsequent PSQI and CES-D was buffered for women in the TYP and, to a lesser extent in STP, compared to those in the UC. Baseline PSQI and CES-D were not significant moderators of the effect of group on any outcome. Behaviorally assessed sleep may be a more robust indicator of which patients are most appropriate for a yoga intervention than self-reported sleep quality. Women with poor sleep efficiency may derive the greatest benefit in terms of sleep quality and mood from a yoga intervention.

19. **Can integrative oncology increase adherence to chemotherapy in advanced gynecologic cancer?**

Authors

Eran Ben-Arye [# 1 2], Naama Nijk [# 3], Ofer Lavie [3 4], Orit Gressel [5 3], Elad Schiff Md [3 6], Noah Samuels [7]

Abstract

Objective: Integrative oncology (IO) has been shown to improve quality-of-life (QoL) and increase adherence to planned chemotherapy regimens. This study examined the impact of a patient-tailored IO program on adherence to chemotherapy among patients with advanced gynecological cancer.

Methods: This prospective non-randomized, pragmatic, preference study examined patients with stage III/IV gynecological cancers undergoing 6 weeks of weekly IO treatments. Adherence to the planned chemotherapy regimen was assessed using the relative dose intensity (RDI) calculation. Patients consistently attending IO treatments (consistent-IO group) were compared to those who were not (non-consistent IO group).

Results: RDI was calculated for 73 patients in the consistent-IO group (99 chemotherapy cycles) and 61 in the non-consistent-IO group (96 cycles with IO care, 126 cycles without). Both groups had similar baseline demographic characteristics, with endometrial cancer more prevalent in the consistent-IO group. RDI was significantly less reduced in the consistent-IO chemotherapy group (p = 0.005). During taxane-based regimens, RDI was better maintained in the consistent-IO group (0.93 vs. 0.87, p = 0.012), though not with platinum-based cycles. Linear regression model found a correlation between preserved RDI and consistent attendance at weekly IO treatments, and lower rates of chemotherapy-induced peripheral neuropathy and pain.

Conclusion: Patient-tailored IO programs for patients with advanced gynecological cancer may help preserve adherence to chemotherapy at 6 weeks, especially with taxane-based regimens. Further research needs to explore whether this correlation is chemotherapy agent-specific.

Keywords: Adherence; Chemotherapy; Complementary medicine; Gynecological cancer; Integrative oncology; Pain; Relative dose intensity.

20. **The influence of visual objects and music on anxiety levels of breast cancer patients scheduled to experience chemotherapy for the first time: a prospective randomized clinical study**

Authors

Yakup İriağaç [1] , Eyyüp Çavdar [2] , Kubilay Karaboyun [2] , Okan Avci [2] , Nehir Tuna [3] , Erdoğan Selçuk Şeber [2]

Abstract

Objective: To investigate the influence of music together with visual objects as an ambiance in the waiting room on anxiety levels of breast cancer patients scheduled to receive chemotherapy in outpatient setting for the first time.

Material and method: Breast cancer patients planned to receive adjuvant or neoadjuvant chemotherapy for the first time between November 1, 2020, and July 31, 2021, were included. Two designs, including a standard waiting room (StWR) and an intervention waiting room (IWR) that was created by adding music and visual objects to the standard room, were constructed. These 2 designs were repeated sequentially in monthly periods, and a total of 104 patients with 52 in each group were randomized. The State Trait Anxiety Inventory (STAI) and Hospital Anxiety and Depression Scale (HADs) were used for assessments. Results of the patients in StWR and IWR groups were compared.

Results: Both HADs anxiety and STAI-state anxiety scale scores were lower in patients who waited in IWR compared to those who waited in StWR ($p = 0.041$, $p = 0.012$, respectively). In patients in the IWR group, mean heart rate was lower by 7.6 bpm ($p = 0.009$). No difference was found between the groups with regard to HADs depression score and STAI-trait anxiety score ($p = 0.305$, $p = 0.535$, respectively). For all patients, HADs anxiety scale ($r = 0.400$, $p = < 0.001$) and STAI-state anxiety scale ($r = 0.475$, $p = < 0.001$) scores increased as the waiting time increased.

Discussion and conclusion: The present study is the first to investigate the influence of adding music together with visual objects to the standard ambiance of the chemotherapy waiting room on anxiety levels of breast cancer patients. We propose that introduction of paintings, artificial plants, and music to the ambiance of the waiting room has a significantly positive effect on alleviating anxiety levels of cancer patients waiting for chemotherapy.

Keywords: Anxiety; Breast cancer; Chemotherapy; Music.

21. **Effectiveness of different acupuncture therapies for chronic cancer pain: A protocol for systematic review and Bayesian network meta-analysis**

Authors

Qingyun Wan [1] , Hao Chen [2] , Xiaoqiu Wang [1] , Hanqing Xi [1] , Shiyu Zheng [1] , Shuting Luo [1] , Wenzhong Wu [1] , Rui Pan [3]

Abstract

Background: Pain is a common and distressing symptom experienced by cancer patients. Previous research found acupuncture was associated with significant reductions in pain intensity and opioid use. Acupuncture therapies are various, and the difference in efficacy and safety has never been assessed. This paper aims to assess and rank the effectiveness of the different acupuncture methods and provide an acupuncture treatment guideline for relieving chronic pain in cancer survivors.

Methods: Four English databases (PubMed, Embase, Cochrane library, and Web of Science) and 4 Chinese databases (China National Knowledge Infrastructure, Wanfang Data, and Chinese Biomedical Literature Database) will be searched for randomized controlled trials (RCTs) published from the database inception to November 30, 2021. The primary outcomes will be patient-reported pain intensity measured by the Brief Pain Inventory, Visual Analog Scale, Verbal Rating Scale, Numerical Rating Scale, and other valid outcome measures. The Grading of Recommendations Assessment, and Development and Evaluation System will evaluate the quality of evidence. Bayesian network meta-analysis will be performed in WinBUGS V.1.4.3 to determine the comparative effectiveness of the acupuncture therapies.

Results: This study will quantify the effectiveness of each acupuncture intervention for chronic cancer pain with pain scores and the use of analgesics. The adverse events of acupuncture treatment for cancer pain will also be reported.

Conclusion: The conclusion of our study will help physicians and patients choose suitable acupuncture methods to manage cancer pain.

22. [**The assessment of spirituality between cancer and chronic inpatients: a cross-sectional study**](#)

Authors

[Yalan Liu](#) [1] , [Hao Xue](#) [2] , [Li Yan](#) [3] , [Yulin Xia](#) [1] , [Yilin Wang](#) [1]

Abstract

Purpose: Spiritual well-being had a protective effect on quality of life in cancer, due to the cultural, regional, and custom differences; it was rarely been discussed between cancer and chronic diseases in Chongqing, China. We aimed at comparing the level of spirituality in two groups and discussing its factors of subjects with cancer at county regions.

Methods: A cross-sectional questionnaire survey was distributed to 630 inpatients who received treatment between January and December 2020 in Chongqing University Three Gorges Hospital. In addition to basic demographic data, spirituality was measured using the Chinese version of Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp-12). The mean, standard deviation, independent t-tests, ANOVA, and multiple regression were used for statistical description and analysis.

Results: Significant differences were found between cancer and chronic diseases in total scores of FACIT-Sp-12 and each domain ($P < 0.05$). The meaning, peace, faith, and total scores in cancer were 11.21 ± 3.38, 10.66 ± 4.46, 11.43 ± 3.54, and 33.3 ± 10.35, respectively, which were lower than chronic diseases (13.00 ± 3.21, 12.95 ± 4.76, 12.66 ± 3.64, 38.61 ± 10.88, respectively). The spiritual well-being had significant differences in gender, character, and emotional with spouse for cancer ($P < 0.05$). The male and extravert character were significantly associated with a greater spiritual well-being.

Conclusion: The study shows a medium level of spiritual well-being in cancer, which stands the population with lower economic and education in county regions. It suggests that under the current nursing mode, we should provide specifically spiritual care to the female, introvert, and those with poor relationship with spouses and create a harmonious doctor-patient environment to improve the spiritual well-being.

23. **[Peristrophe bicalyculata (Retz) Nees contains principles that are cytotoxic to cancer cells and induce caspase-mediated, intrinsic apoptotic death through oxidative stress, mitochondrial depolarisation and DNA damage](#)**

Authors

[Mansurah A Abdulazeez](#) [1] , [Hiba A Jasim](#) [2] , [Musa Bashir](#) [3] , [Kehinde Ross](#) [4] , [Amos A Fatokun](#) [5]

Abstract

The plant Peristrophe bicalyculata (Retz) Nees is used for the treatment of cancer. While its leaf extracts have been shown to inhibit the growth of some cancer cells, there is little information supporting the constituents' anti-tumour potential. This study, therefore, investigated the effects of the plant's leaf extracts on cancer cells and the associated cellular/molecular mechanisms. Extracts were prepared using hexane (PBH), chloroform (PBC), ethyl acetate (PBE) and methanol (PBM) and constituents were identified by Liquid Chromatography-Mass Spectrometry (LC-MS). Their cytotoxic effects on human cervical (HeLa) and lung cancer (MRC5-SV2) cells were assessed using the MTT and LDH release assays. Reactive oxygen species (ROS) production was assessed using 2',7'-dichlorofluorescein diacetate (DCFDA) and mitochondrial membrane potential by staining with JC-1 (5,5',6,6'-tetrachloro-1,1',3,3'-tetraethylbenzimidazolyl-carbocyanine iodide).

Caspase activation was determined using a Caspase-Glo-3/7 assay, and DNA damage by the Comet assay. Changes to mRNA expression were assessed using Quantitative Real-Time PCR. PBC, PBE and PBM reduced cell viability and induced LDH release, with IC_{50} values (48 h, MTT, in µg/ml), respectively, of 6.21 ± 0.70, 23.39 ± 3.92, and 22.43 ± 3.58 (HeLa); and 1.98 ± 0.33, 8.57 ± 1.91 and 28.24 ± 5.57 (MRC5-SV2). PBC induced ROS, while PBC, PBE and PBM impaired mitochondrial membrane potential and induced caspase 3/7 activation. PBC and PBE induced DNA damage, and PBE induced caspase-3 mRNA expression. Constituents of the extracts included derivatives of gallic acid, dipeptides, diterpenoids and flavones. We conclude that P. bicalyculata contains cytotoxic principles that could be potential leads for developing novel anti-cancer agents.

24. **[Wound healing, anti-inflammatory and anti-melanogenic activities of ursane-type triterpenes from Semialarium mexicanum (Miers) Mennega](#)**

Authors

Luis Apaza Ticona [1] , Karla Slowing [2] , Andreea Madalina Serban [3] , Marcos Humanes Bastante [4] , María J Hernáiz [5]

Abstract

Ethno-pharmacological relevance: The bark of Semialarium mexicanum commonly known as 'Cancerina' is used as an infusion in Central America and Mexico to treat various wound infections, as well as skin and vaginal ulcers.

Aim of the study: This study aimed to determine the wound healing, anti-inflammatory and anti-melanogenic activities of the aqueous extract of Semialarium mexicanum and to identify the compounds related to these activities.

Materials and methods: A bio-guided isolation of the active compounds of Semialarium mexicanum was carried out, selecting the sub-extracts and fractions depending on their wound healing, anti-inflammatory and anti-melanogenic activities in the RAW 264.7, NIH/3T3 and B16-F10 cells.

Results: Three compounds were obtained and characterised by nuclear magnetic resonance and mass spectrometry. These compounds are (3β)-3-Hydroxy-urs-12-en-28-oic acid (1), (3β)-Urs-12-ene-3,28-diol (2) and (2α, 19α)-2,19-Dihydroxy-3-oxo-urs-12-en-28-oic acid (3). Regarding the anti-inflammatory activity, the three compounds inhibited the production of NF-κB and NO, however, compound 3 was the most active with IC_{50} values of 8.15-8.19 µM and 8.94-9.14 µM, respectively, in all cell lines. The anti-melanogenic activity of these compounds was evaluated by the inhibition of tyrosinase and melanin in the B16-F10 cell line. The three compounds showed anti-melanogenic activity, however, compound 3 was the most active with an IC_{50} of 8.03 µM for

the inhibition of tyrosinase production, and an IC_{50} of 8.53 μM for the inhibition of melanin production. Finally, concerning the wound healing activity, the three compounds presented proliferative activity in all the tested cell lines, however, compound 3 showed higher cell proliferation percentages than compounds 1 and 2 (88.89-89.60% compared to 64.92-65.71% and 71.53-71.99%, respectively).

Conclusion: The wound healing, anti-inflammatory and anti-melanogenic activity of the aqueous extract of Semialarium mexicanum was tested and analysed in the present study, after having isolated three ursane-type triterpenes.

25. **Network Pharmacology Prediction: The Possible Mechanisms of Cinobufotalin against Osteosarcoma**

Authors

Riyu Chen [1], Zeyi Guan [2], Xianxing Zhong [1], Wenzheng Zhang [3], Ya Zhang [4]

Abstract

Objective: To explore the active compounds and targets of cinobufotalin (huachansu) compared with the osteosarcoma genes to obtain the potential therapeutic targets and pharmacological mechanisms of action of cinobufotalin on osteosarcoma through network pharmacology.

Methods: The composition of cinobufotalin was searched by literature retrieval, and the target was selected from the CTD and TCMSP databases. The osteosarcoma genes, found from the GeneCards, OMIM, and other databases, were compared with the cinobufotalin targets to obtain potential therapeutic targets. The protein-protein interaction (PPI) network of potential therapeutic targets, constructed through the STRING database, was inputted into Cytoscape software to calculate the hub genes, using the NetworkAnalyzer. The hub genes were inputted into the Kaplan-Meier Plotter online database for exploring the survival curve. Functional enrichment analysis was identified using the DAVID database.

Results: 28 main active compounds of cinobufotalin were explored, including bufalin, adenosine, oleic acid, and cinobufagin. 128 potential therapeutic targets on osteosarcoma are confirmed among 184 therapeutic targets form cinobufotalin. The hub genes included TP53, ACTB, AKT1, MYC, CASP3, JUN, TNF, VEGFA, HSP90AA1, and STAT3. Among the hub genes, TP53, ACTB, MYC, TNF, VEGFA, and STAT3 affect the patient survival prognosis of sarcoma. Through function enrichment analysis, it is found that the main mechanisms of cinobufotalin on osteosarcoma include promoting sarcoma apoptosis, regulating the cell cycle, and inhibiting proliferation and differentiation.

Conclusion: The possible mechanisms of cinobufotalin against osteosarcoma are preliminarily predicted through network pharmacology, and further experiments are needed to prove these predictions.

26. [**Implementing an evidence-based somatic acupressure intervention in breast cancer survivors with the symptom cluster of fatigue, sleep disturbance and depression: study protocol of a phase II randomised controlled trial**](#)

Authors

Tao Wang [1], Jing-Yu Benjamin Tan [2], Xian-Liang Liu [1], Si-Lin Zheng [3], Isabella Zhao [1] [4], Sabina Eliseeva [1] [5], Mary Janice Polotan [1] [5], Hui-Lin Cheng [1] [6], Hou-Qiang Huang [3]

Abstract

Introduction: The fatigue-sleep disturbance-depression (FSD) symptom cluster, as one of the most common symptom clusters in breast cancer (BC) survivors, can significantly decrease patients' quality of life. Since the management of the FSD symptom cluster has been unsatisfactory with the use of pharmacological treatments alone, non-pharmacological approaches have, therefore, been recommended. Somatic acupressure (SA) is a promising approach given its potential benefits of cancer-related symptom alleviation and the convenience of self-practice. However, research evidence on using acupressure to manage the FSD symptom cluster has been limited. The proposed trial aims to examine the feasibility and preliminary effects of an evidence-based SA intervention for FSD symptom cluster management in BC survivors.

Methods and analysis: This study will be a phase II randomised controlled trial with three study arms and 1:1:1 allocation. Fifty-one early-stage BC survivors who are experiencing the FSD symptom cluster will be randomly assigned to a true SA group, a sham SA group or a usual care group. All participants will receive an education booklet regarding FSD symptom cluster management advice as the usual care package. The participants in the true SA group will additionally receive a 7-week self-administered SA intervention. The participants in the sham SA group will additionally receive self-administered light acupressure at non-acupoints with the same frequency, session and duration as the true SA group. The primary outcomes will be feasibility outcomes related to subject recruitment and completion of study questionnaires and interventions. The secondary outcomes will be the effects of SA on fatigue, sleep disturbance, depression and quality of life. Descriptive statistics will be used to present all the outcomes. The secondary outcomes will be analysed using an intent-to-treat approach.

Ethics and dissemination: Ethical approvals of this trial have been granted by the Human Research Ethics Committee at Charles Darwin University (H19017) and the Clinical Trial Ethics Committee at The Affiliated Hospital of Southwest Medical University (KY2019039). Findings from this trial will be published in peer-reviewed journals and presented at professional conferences.

Trial registration number: This trial was registered at ClinicalTrials.gov and the registration number is NCT04118140, with the stage at Recruiting.

27. [**The Potential Mechanisms by which Artemisinin and Its Derivatives Induce Ferroptosis in the Treatment of Cancer**](#)

Oxid Med Cell Longev. 2022 Jan 4;2022:1458143. doi: 10.1155/2022/1458143. eCollection 2022.

Authors

Yingying Hu [#][1], Nan Guo [#][1], Ting Yang [1], Jianghong Yan [1], Wenjun Wang [2], Xiang Li [1]

Abstract

Artemisinin (ART) is a bioactive molecule derived from the Chinese medicinal plant Artemisia annua (Asteraceae). ART and artemisinin derivatives (ARTs) have been effectively used for antimalaria treatment. The structure of ART is composed of a sesquiterpene lactone, including a peroxide internal bridge that is essential for its activity. In addition to their well-known antimalarial effects, ARTs have been shown recently to resist a wide range of tumors. The antineoplastic mechanisms of ART mainly include cell cycle inhibition, inhibition of tumor angiogenesis, DNA damage, and ferroptosis. In particular, ferroptosis is a novel nonapoptotic type of programmed cell death. However, the antitumor mechanisms of ARTs by regulating ferroptosis remain unclear. Through this review, we focus on the potential antitumor function of ARTs by acting on ferroptosis, including the regulation of iron metabolism, generation of reactive oxygen species (ROS), and activation of endoplasmic reticulum stress (ERS). This article systematically reviews the recent progress in ferroptosis research and provides a basis for ARTs as an anticancer drug in clinical practice.

28. [**Network Pharmacology-Based Study on the Active Component and Mechanism of the Anti-Non-Invasive and Invasive Bladder Urothelial Carcinoma Effects of Zhuling Jisheng Decoction**](#)

Comput Math Methods Med. 2021 Dec 31;2021:7667707. doi: 10.1155/2021/7667707. eCollection 2021.

Authors

Chenyu Ma [1], Jianlong Wang [2], Na Zhao [3], Zhenya Pan [3], Yi Lu [4], Miao Cheng [5], Min Deng [3]

Abstract

Zhuling Jisheng decoction is employed for the treatment of bladder urothelial cancer in clinical practice of traditional Chinese medicine. However, there are few studies on its precise mechanism. For the antibladder cancer action of Zhuling Jisheng decoction, a network pharmacological technique was used to design a component/target/pathway molecular regulatory network. The TCMSP dataset was used to identify the chemical makeup of Zhuling Jisheng decoction, which was then analyzed and assessed for oral bioavailability and pharmacological similarity. The chemical composition of Zhuling Jisheng decoction was identified through the TCMSP database, and it was evaluated and screened based on oral bioavailability and drug similarity. The GEO database was searched for genes associated with urothelial bladder carcinoma, and gene targets associated with bladder urothelial cancer resistance were chosen by comparison. The function and linked pathways of the target genes were examined and screened using annotation, visualization, and a comprehensive discovery database. The impact of Zhuling Jisheng decoction on urothelial bladder cancer was studied using Cytoscape software to create a component/target/pathway network. Finally, 69 and 55 target genes were discovered for noninvasive bladder urothelial cancer and invasive bladder urothelial cancer, respectively. In noninvasive urothelial cancer, 118 pathways were highly enriched, including the TNF signaling pathway and the IL-17 signaling route. 103 pathways were highly enriched in invasive urothelial cancer, including the p53 signaling route, bladder cancer route, and calcium signaling route. There were 18 and 15 drug targets associated with noninvasive and invasive bladder urothelial carcinoma prognoses. Many signaling pathways directly act on tumours, and indirect pathways inhibit the development of bladder urothelial carcinoma. This research establishes a scientific foundation for further research into the framework of action of Zhuling Jisheng decoction in the therapy of bladder urothelial cancer.

[Tai Chi and other mind-body interventions for cancer-related fatigue: an updated systematic review and network meta-analyses protocol](#)

29.

Authors

[Hong-Juan Fu](#) [1] [2], [Hao Zhou](#) [2], [Yong Tang](#) [3], [Jie Li](#) [1], [Da Zhang](#) [2], [Song-Yi Ding](#) [2], [Qin-Wan Huang](#) [4], [Chao Wang](#) [5] [2]

Abstract

Introduction: Fatigue is one of the most common symptoms in patients with cancer and is responsible for a reduced quality of life. There is a strong evidence base for mind-body

interventions (MBIs) to manage cancer-related fatigue (CRF). However, the efficacy of Tai Chi and other MBIs in the treatment of CRF remains controversial.

Methods and analysis: We will perform a systematic review and network meta-analyses (NMAs) that aim to assess the effects of Tai Chi and other MBIs in patients with CRF. The following databases will be searched from their inception to 1 August 2021: PubMed, EMBASE, Scopus, OVID, Web of Science, Cochrane Central Register of Controlled Trials, the China National Knowledge Infrastructure, China Science and Technology Journal Database, Chinese Biomedical Database and Wan Fang Digital Journals. We will include randomised controlled trials that compare MBIs with no treatment, placebo and usual care in the treatment of CRF. The primary outcome will be changes in the fatigue state as evaluated by validated scales. We will perform a Bayesian NMA to analyse all the evidence for each outcome. The surface under the cumulative ranking curve and the mean ranks will be used to rank the various treatments. We will assess the quality of evidence contributing to network estimates of outcomes using the Grading of Recommendations Assessment, Development and Evaluation system framework.

Ethics and dissemination: This NMAs will be disseminated through publication in a peer-reviewed journal. Since no individual patient data will be involved in the review, ethics approval and concerns about privacy are not needed.

Prospero registration number: CRD42021244999.

30. [**Use of coumarins as complementary medicine with an integrative approach against cervical cancer: background and mechanisms of action**](#)

Authors

[B de la Cruz-Concepción](#) [1] , [A Gutiérrez-Escobar](#), [H Y Lorenzo-Moran](#), [N Navarro-Tito](#), [D N Martínez-Carrillo](#), [C Ortuño-Pineda](#), [A E Zacapala-Gómez](#), [F I Torres-Rojas](#), [R Dircio-Maldonado](#), [H Jiménez-Wences](#), [C Sotelo Leyva](#), [M A Mendoza-Catalán](#)

Abstract

Cervical cancer is characterized by the cellular transformation caused by Human Papillomavirus (HPV), favoring cell proliferation, migration, invasion, and metastasis. Cervical cancer is conventionally treated with radiation therapy, and chemotherapy focused on the destruction of tumor cells. However, chemoresistance and low selectivity between tumor and non-tumor cells have been reported, causing side effects in patients. Metabolites of natural origin have shown selectivity against tumor cells, suggesting their use for reducing the side effects caused by drugs used in conventional therapy. Among these compounds, several natural coumarins stand out, such as auraptene, scopoletin, osthole, and praeruptorin, of which antiproliferative, anti-migratory, and anti-invasive activity have been reported. Auraptene, scopoletin, osthole, and

praeruptorin show a cytotoxic or antiproliferative effect on cervical tumor cells, arresting the cell cycle by inducing the overexpression of negative regulators of the cell cycle, or inducing cell death by increasing the expression of pro-apoptotic proteins and decreasing that of anti-apoptotic proteins. On the other hand, auraptene, scopoletin, and praeruptorin inhibit the capacity for migration, invasion, and metastasis of cervical tumor cells, mainly by inhibiting the expression and activity of matrix metalloproteinase-2 and -9. The PI3K/Akt signal pathway appears to be central to the anti-tumor activity of the coumarins analyzed in this review. In addition, auraptene, osthole, and praeruptorin are useful in sensitizing tumor cells to radiotherapy or chemotherapeutic molecules, such as FOLFOX, cisplatin, or DOX. Coumarins offer an excellent possibility for developing new drugs as complementary medicine with an integrative approach against cervical cancer.

Role of Ayurvedic Plants as Anticancer Agents

31.

Authors

Nikhil Pandey [1], Y B Tripathi [2]

Abstract

The use of natural products has been increasing at a rapid pace, worldwide, with the aim to maintain a healthy lifestyle and to modify one's dietary habits. Ayurveda is a domain that has numerous wealth of information concerning medicinal plants and its part in controlling numerous ailments, such as neoplastic, cardiovascular, neurological plus immunological ailments. The use of such medicinal plants is important for preventing such diseases, especially "cancer" which is the succeeding foremost cause of mortality collectively. Even though abundant developments have been made in the management and control of cancer progression, substantial deficits and scope for advancement still continue to be unchanged. Several lethal adjacent consequences occur throughout the course of chemotherapy. Natural treatments, such as the use of plant-derived products in the treatment of cancer, might reduce the hostile side effects. Presently, a few plant-based products and its phytoconstituents are being utilized for the management of cancer. Here we have focused on numerous plant-derived phytochemicals and promising compounds from these plants to act as anticancer agents, along with their mechanisms of action.

Suicide gene therapy in cancer and HIV-1 infection: An alternative to conventional treatments

32.

Authors

Sepideh Saeb [1], Jeanne Van Assche [2], Thomas Loustau [2], Olivier Rohr [2], Clémentine Wallet [2], Christian Schwartz [3]

Abstract

Suicide Gene Therapy (SGT) aims to introduce a gene encoding either a toxin or an enzyme making the targeted cell more sensitive to chemotherapy. SGT represents an alternative approach to combat pathologies where conventional treatments fail such as pancreatic cancer or the high-grade glioblastoma which are still desperately lethal. We review the possibility to use SGT to treat these cancers which have shown promising results in vitro and in preclinical trials. However, SGT has so far failed in phase III clinical trials thus further improvements are awaited. We can now take advantages of the many advances made in SGT for treating cancer to combat other pathologies such as HIV-1 infection. In the review we also discuss the feasibility to add SGT to the therapeutic arsenal used to cure HIV-1-infected patients. Indeed, preliminary results suggest that both productive and latently infected cells are targeted by the SGT. In the last section, we address the limitations of this approach and how we might improve it.

Keywords: Glioblastoma; HIV-1; Latent reservoirs; Pancreatic cancer; Suicide gene.

33. **[Essential oils as anticancer agents: Potential role in malignancies, drug delivery mechanisms, and immune system enhancement](#)**

Authors

[Mansi Sharma](#) [1] , [Kamaljit Grewal](#) [2] , [Rupali Jandrotia](#) [2] , [Daizy Rani Batish](#) [3] , [Harminder Pal Singh](#) [4] , [Ravinder Kumar Kohli](#) [2]

Abstract

Cancer retains a central place in fatality rates among the wide variety of diseases known world over, and the conventional synthetic medicaments, albeit used until now, produce numerous side effects. As a result, newer, better, and safer alternatives such as natural plant products, are gravely required. Essential oils (EOs) offer a plethora of bioactivities including antibacterial, antiviral, antioxidant, and anticancer properties, therefore, the use of EOs in combination with synthetic drugs or aromatherapy continues to be popular in many settings. In view of the paramount importance of EOs and their potential bioactivities, this review summarizes the current knowledge on the interconnection between EOs and cancer treatment. In particular, the current review presents an updated summary of the chemical composition of EOs, their current applications in cancer treatments based on clinical studies, and the mechanism of action against the cancer cell lines. Similarly, an overview of using EOs in aromatherapy and enhancing immunity during cancer treatment is provided. Further, this review focuses on the recent technological advancements such as the loading of EOs using protein microspheres, ligands, or nanoemulsions/nanoencapsulation, which offer multiple benefits in cancer treatment via site-

specific and target-oriented delivery of drugs. The continuing clinical studies of EOs implicate that their pharmacological applications are a rewarding research area.

34. **[Myasthenia gravis: The pharmacological basis of traditional Chinese medicine for its clinical application](#)**

Biofactors. 2022 Jan;48(1):228-238. doi: 10.1002/biof.1812. Epub 2021 Dec 18.

Authors

[Shen Xiaoyue] [1] , [Li Yanbin] [2]

Abstract

We aimed to investigate the target and signal pathway of Smilacis Glabrae Rhixoma (SGR) in the treatment of myasthenia gravis (MG) based on network pharmacology, and to explore its potential molecular mechanism. The main active components of SGR were searched in the pharmacology database of traditional Chinese medicine systems, and analysis platform. The related targets of SGR were obtained by Genecards, connective tissue disease, therapeutic target database, Drugbank, and Online Mendelian Inheritance in Man database. Moreover, the target information was corrected through UniProtKB and also, this data integrated to draw the "Ingredients-targets" network of SGR. Protein interaction analysis was performed in data platform, gene ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathways as well as enrichment analysis on disease-drug target was carried out through metascape online platform. A total of 15 active components were collected from SGR, which correspond to 159 targets; There were 1758 MG-related targets; there are 81 targets related to both drug components and diseases, including 12 key targets. In GO bioaccumulation analysis, 1933 GO items were gathered, which were mainly related to the metabolism of active oxygen species and the active factors of postsynaptic neurotransmitter receptor. According to KEGG analysis, SGR may play a role in the treatment of MG through phosphatidylinositol-3-kinase-protein kinase B signaling pathway, T-cell receptor, cAMP, tumor necrosis factor (TNF), and interleukin-17 (IL-17) signaling pathway, Th17 cell differentiation, endocrine resistance, hepatitis, and some cancer pathways. This study shows that SGR mainly treat myasthenia gravis through the regulation of TNF, MAPK1, JUN, TP53 and other targets, T-cell receptor, TNF, and IL-17 signaling pathway, Th17 cell differentiation and other pathways, which reflects the characteristics of multicomponent, multitarget, and multichannel of traditional Chinese medicine, and providing a certain pharmacological basis for the follow-up study.

35. **[Predictors of Pain Reduction in Trials of Interventions for Aromatase Inhibitor-Associated Musculoskeletal Symptoms](#)**

JNCI Cancer Spectr. 2021 Oct 30;5(6):pkab087. doi: 10.1093/jncics/pkab087. eCollection 2021 Dec.

Authors

N Lynn Henry [1], Joseph M Unger [2] [3], Cathee Till [2] [3], Katherine D Crew [4], Michael J Fisch [5], Dawn L Hershman [4]

Abstract

Background: Almost one-half of aromatase inhibitor (AI)-treated breast cancer patients experience AI-associated musculoskeletal symptoms (AIMSS); 20%-30% discontinue treatment because of severe symptoms. We hypothesized that we could identify predictors of pain reduction in AIMSS intervention trials by combining data from previously conducted trials.

Methods: We pooled patient-level data from 3 randomized trials testing interventions (omega-3 fatty acids, acupuncture, and duloxetine) for AIMSS that had similar eligibility criteria and the same patient-reported outcome measures. Only patients with a baseline Brief Pain Inventory average pain score of at least 4 of 10 were included. The primary outcome examined was 2-point reduction in average pain from baseline to week 12. Variable cut-point selection and logistic regression were used. Risk models were built by summing the number of factors statistically significantly associated with pain reduction. Analyses were stratified by study and adjusted for treatment arm.

Results: For the 583 analyzed patients, the 4 factors statistically significantly associated with pain reduction were Functional Assessment of Cancer Therapy Functional Well-Being greater than 24 and Physical Well-Being greater than 14 (higher scores reflect better function), and Western Ontario and McMaster Universities Osteoarthritis Index less than 50 and Modified Score for the Assessment and Quantification of Chronic Rheumatoid Affections of the Hands less than 33 (lower scores reflect less pain). Patients with all 4 factors were greater than 6 times more likely to experience at least a 2-point pain reduction (odds ratio = 6.37, 95% confidence interval = 2.31 to 17.53, 2-sided P < .001); similar results were found for secondary 30% and 50% pain reduction endpoints.

Conclusions: Patients with AIMSS who have lower symptom and functional distress at study entry on AIMSS intervention trials are more likely to experience meaningful pain reduction. Baseline symptom and functional status should be considered as stratification factors in future interventional trials.

Skincare application of medicinal plant polysaccharides - A review

36.

Authors

Priscilla Barbosa Sales Albuquerque [1], Weslley Felix de Oliveira [2], Priscila Marcelino Dos Santos Silva [2], Maria Tereza Dos Santos Correia [2], John F Kennedy [3], Luana Cassandra Breitenbach Barroso Coelho [4]

Abstract

Polysaccharides are macromolecules with important inherent properties and potential biotechnological applications. These complex carbohydrates exist throughout nature, especially in plants, from which they can be obtained with high yields. Different extraction and purification methods may affect the structure of polysaccharides and, due to the close relationship between structure and function, modify their biological activities. One of the possible applications of these polysaccharides is acting on the skin, which is the largest organ in the human body and can be aged by intrinsic and extrinsic processes. Skincare has been gaining worldwide attention not only to prevent diseases but also to promote rejuvenation in aesthetic treatments. In this review, we discussed the polysaccharides obtained from plants and their innovative potential for skin applications, for example as wound-healing, antimicrobial, antioxidant and anti-inflammatory, antitumoral, and anti-aging compounds.

The effect of antioxidants in Ehrlich Ascites Cancer

37.

Authors

Seher Yılmaz [1], Adem Tokpınar [1], Ece Eroğlu [2], Şükrü Ateş [1], Rabbia Zahid [3], Seda Avnioğlu [4], Özlem Bozkurt [5], Mehtap Nisari [6]

Abstract

A fundamental goal in molecular oncology is to unravel the underlying mechanisms which cause the cell transformation. In line with this approach, genome-wide functional screening approaches have revealed exciting insights into heterogeneous nature of cancer. Rapidly expanding horizons of research have unraveled myriad of pathways which play instrumental role in carcinogenesis and metastasis. Oxidative stress has also been reported to be significantly involved in cancer onset and progression. In line with this approach, oxidative stress modulating chemicals have always been sharply divided into antioxidants and oxidative stress-inducing agents. Conceptual and experimental advancements have enabled us to critically analyze full potential of these two different groups of chemicals in cancer chemoprevention. Different antioxidants are currently being analyzed in different phases of clinical trials. Although it has been reported in the literature that antioxidant supplements reduce tumor cells in some tumors or cause volume reduction in solid tumor sizes, there is no definite consensus. Therefore, an antioxidant supplement guideline based on more detailed clinical research and as a result of these is needed to achieve the best care for cancer patients and to avoid risky treatments for cancer patients.

38. **[Medicinal plants used by patients to fight cancer in northwestern Algeria](#)**

Authors

[Latifa Bouhaous](#) [1] , [Mohamed Djamel Miara](#) [2] , [Hamdi Bendif](#) [3] , [Nabila Souilah](#) [4]

Abstract

Cancer is among the deadliest diseases in the world, especially in developed countries where modern treatments are not available to everyone. In North Africa, and especially in Algeria, few herbal treatments against cancer have been documented despite the richness of flora in these countries. This research aim to documents the medicinal plants used by patient to fight cancer in the northwest of Algeria. Data were collected through ethnobotanical surveys engaging 211 cancer patients in hospitals (departments of medical oncology) in two of the largest provinces in northwest Algeria (Tiaret and Tlemcen). The data were organized into usage reports (UR), while the Informant Consensus Factor (ICF) was calculated to evaluate agreement among informants. The patients investigated were mainly women, of middle age (41-50 years) and illiterate. In total, 53 medicinal plants used against several types of cancer have been identified. These plants are dominated by Lamiaceae, Apiaceae and Rosaceae. The leaves and powder of plants are most often used in traditional preparations often mixed with honey. The plants most often cited in the survey were Aristolochia longa, Aquilaria malaccensis, Ephedra alata subsp. alenda, while the most often treated cancer were breast, cervical, colorectal and stomach. 23 plants are not known as a treatment against cancers in North Africa, while 25 plants already known as treatment for cancer were cited here to treat specific new types of this disease.

39. **[Acupuncture combined with opioids for cancer pain: a pilot pragmatic randomized controlled trial](#)**

Authors

[Yihan He](#) [1] [2] , [Haibo Zhang](#) [3] , [Yifang Li](#) [4] , [Shunqin Long](#) [3] , [Shujing Xiao](#) [3] , [Brian H May](#) [2] , [Anthony Lin Zhang](#) [2] , [Xinfeng Guo](#) [1] , [Charlie Changli Xue](#) [1] [2] , [Chuanjian Lu](#) [1] [2] [5]

Abstract

Objective: Given the existing evidence for the analgesic effect of acupuncture, the current study aimed to assess whether acupuncture could be feasible and manageable as an adjunctive therapy for cancer pain in a real-world hospital setting.

Methods: Thirty patients in an Oncology department with moderate or severe pain were recruited and randomized to an adjunctive acupuncture group or control group, who received pharmacotherapy for pain management without acupuncture. The duration of the treatment course was 1 week with a 2-week follow-up. In total, four acupuncture sessions were administered, on days 1/2/4/6 of the trial. Pain intensity was measured using a numerical rating scale (NRS) and the daily opioid dose was recorded.

Results: The overall trends favored acupuncture for both pain intensity and daily opioid consumption. The proportion of participants experiencing at least a 2-point reduction in the NRS at the end of the treatment was 93% (n = 14/15) for the acupuncture group and 57% (n = 8/14) for the control group (risk difference (RD) 36.1%, 95% confidence interval (CI) [7.4%-65.0%]; relative risk (RR) 1.63, 95% CI [1.02-2.62]; p = 0.04). There were no serious adverse events and no dropouts during the treatment.

Conclusion: This pilot study showed that adding acupuncture to routine analgesia for patients with cancer pain was feasible and acceptable to patients. The clinical effects of adding acupuncture as an adjunctive therapy need to be further evaluated.

40. [**Coptis chinensis and dried ginger herb combination inhibits gastric tumor growth by interfering with glucose metabolism via LDHA and SLC2A1**](#)

Authors

[Min Fu](#) [1] , [Yanju Liu](#) [1] , [Huanbo Cheng](#) [1] , [Kang Xu](#) [2] , [Guangzhong Wang](#) [3]

Abstract

Ethnopharmacological relevance: Coptis chinensis Franch (CC) and Zingiber officinale Roscoe (dried ginger; DG) are traditional Chinese medicines. CC can dry dampness, relieve fire and detoxify, and is used to treat gastritis, gastric ulcer, colitis. DG can warm spleen and stomach for dispelling cold, used for the treatment of spleen and stomach deficiency. Both CC and DG are widely used to treat gastrointestinal diseases. CC-DG herb medicine combination originates from Huanglian decoction and Pinellia xiexin decoction in "Shanghan Lun" to comfort the stomach and intestines. CC and DG are used for the treatment of nausea and choking diaphragm which highly associated with gastric cancer clinically in ancient time.

Aim of the study: This study aimed to investigate the effects and underlying molecular mechanisms of CC-DG combination on gastric cancer.

Materials and methods: The CC-DG extract was subjected to HPLC analysis. Viability (MTT) and cytotoxicity (CCK8) assays were performed using the SGC7901 and MFC cells. Cell cycle and

apoptosis were measured by flow cytometry. The mRNA expression levels were measured by RT-PCR. In vivo anti-tumor activity of CC-DG was assessed in a tumor xenograft model.

Results: Twelve different proportions of CC-DG were tested for inhibitory effects on gastric cancer cells; CC-DG ratio 1:1 was found most effective. CC-DG administration significantly reduced the cell proliferation, migration, and colony formation, while increased cell apoptosis compared with the control group. CC-DG regulated differentially expressed genes in SGC7901 cells were subjected to pathway enrichment analysis. CC-DG significantly inhibited the cell glucose metabolism, downregulated the expression of LDHA and SLC2A1 genes, and changed the expression of other related genes including ME2, LDHD, LDHB, HIF1A, PKM, Pcx, and Got1. In addition, CC-DG suppressed tumorigenesis and inhibited MKI67 expression in the tumor xenograft model.

Conclusions: CC-DG inhibited the proliferation, migration, invasion of SGC7901/MFC gastric cells, and in turn, suppressed tumorigenesis by regulating glucose metabolism through regulation of LDHA and SLC2A1 genes.

41. **[Induction of apoptosis by Eleutherine bulbosa (Mill.) Urb. bulb extracted under optimised extraction condition on human retinoblastoma cancer cells (WERI-Rb-1)](#)**

Authors

[Ammar Akram Kamarudin](#) [1] , [Nor Hafiza Sayuti](#) [2] , [Norazalina Saad](#) [3] , [Nor Asma Ab Razak](#) [4] , [Norhaizan Mohd Esa](#) [5]

Abstract

Ethnopharmacological relevance: The bulb of Eleutherine bulbosa (Mill.) Urb. is an indigenous medicinal plant traditionally used among Dayak people for the management of diabetes, breast cancer, hypertension, stroke, and fertility problems in women. The bulb has been reported with a potent cytotoxic potential but with limited underlying mechanisms.

Aim of the study: This study aimed to investigate the cytotoxic properties of E. bulbosa ethanolic bulb extracted under optimised extraction condition on retinoblastoma cancer cells (WERI-Rb-1) through in vitro cell culture bioassays. The optimised extraction condition has been determined in the previous reports.

Materials and methods: Cytotoxic assay was analysed through MTT assay. Comparison between non-optimised and optimised extraction condition from E. bulbosa ethanolic bulb extract was evaluated. Morphological assessment of apoptotic cells was conducted through acridine orange propidium iodide (AOPI) staining using fluorescence microscopy. Apoptosis assay was carried out through Annexin V-FITC and cell cycle analysis through PI staining. The effect of varying

concentrations (IC_{25}, IC_{50}, IC_{75}) of the optimised E. bulbosa ethanolic bulb extract was observed. The mRNA expression was also conducted to confirm the underlying mechanism.

Results: The optimised E. bulbosa ethanolic bulb extract markedly suppressed the proliferation of retinoblastoma cancer cells significantly with an IC_{50} value of 15.7 µg/mL as compared to non-optimised extract (p < 0.01). Fluorescence microscopy revealed that retinoblastoma cancer cells manifested early features of apoptosis-like membrane blebbing, chromatin condensation and formation of apoptotic bodies in a dose-dependent manner. The number of apoptotic cells were greatly observed in early and late apoptosis through Annexin V-FITC and the extract also induced cell arrestment as compared to the untreated group. The apoptosis was confirmed with the upregulation of Bax, Bad, p53, Caspase 3, Caspase 8, and Caspase 9 genes meanwhile, Bcl-2, BcL-xL, Nrf-2, and HO-1 genes were downregulated.

Conclusion: The optimised E. bulbosa ethanolic bulb extract induced a significant cell death and cell cycle arrestment on retinoblastoma cancer cells. It could be suggested that the induction of apoptosis in retinoblastoma cancer cells may be due to the synergistic effect of the bioactive compounds extracted under optimised extraction condition. Our findings indicated that E. bulbosa bulb could be promising chemotherapeutic potential to treat retinoblastoma cancer cells.

[Pseudevernia furfuracea inhibits migration and invasion of colorectal carcinoma cell lines](#)

42.

Authors

[Dragana S Šeklić](#) [1], [Milena M Jovanović](#) [2], [Katarina D Virijević](#) [3], [Jelena N Grujić](#) [4], [Marko N Živanović](#) [5], [Snežana D Marković](#) [6]

Abstract

Ethnopharmacological relevance: Pseudevernia furfuracea (L.) Zopf is common lichen species, traditionally used worldwide in treating various medical conditions, among which are intestinal issues and cancer. Most studies are focused mainly on cytotoxic potential of lichens, whilst their antimigratory and antiinvasive properties are often disregarded. Migration and invasion of cancer cells are pivotal processes in cancer metastasis, wherein cancer cells are able to migrate individually or in form of a coherent mass. One of successful strategies in anticancer treatments is targeting Wnt/β-catenin signal pathway, that is aberrantly activated in colorectal carcinoma, as well as lowering level of migratory/invasive markers.

Aim of the study: Present study aimed to show antimigratory/invasive potential of Pseudevernia furfuracea methanol extract on HCT-116 and SW-480 colorectal carcinoma cell lines and to elucidate possible mechanism of its action.

Materials and methods: Collective cell migration was assessed by Wound healing assay and single cell migration in real time by RTCA method. Analysis of anti- and promigratory protein expression was performed using immunofluorescent staining. Additionally, gene expression of antimigratory/promigratory and invasive (E-cadherin, β-catenin, N-cadherin, Vimentin, Snail and MMP-9) markers were investigated by qRT-PCR method. Concentration of MMP-9 was determined colorimetrically by ELISA test.

Results: P. furfuracea extract was able to suppress both collective and single cancer cell migration, by inhibiting expression of promigratory/invasive markers and possibly re-establishing cell-cell adhesions. The present study indicates at P. furfuracea as effective antimigratory treatment, and HCT-116 cells were proved to be a more sensitive cell line to applied treatment.

Conclusions: This lichen species is a promising candidate for application in treatment of cancer in order to prevent metastasis.

43.
[Regulatory roles of phytochemicals on circular RNAs in cancer and other chronic diseases](#)

Authors

[Shasha Zhang](#) [1], [Fangyi Long](#) [2], [Hong Lin](#) [1], [Xi Wang](#) [1], [Gang Jiang](#) [1], [Ting Wang](#) [3]

Abstract

As novel non-coding RNAs (ncRNAs), circular RNAs (circRNAs) play an essential role in the pathogenesis of many chronic diseases, and the regulation of these functional molecules has become a research hotspot gradually. Within the past decade, phytochemicals were reported to regulate the expression of long non-coding RNAs (lncRNAs) and microRNAs (miRNAs) in various chronic diseases, and more recently, most studies focus on the regulatory roles of phytochemicals on circRNAs. Abnormal expression of circRNAs has been identified in chronic diseases like cancer, heart failure, depression and atherosclerosis, and numerous studies have revealed the modulation of circRNAs by phytochemicals including berberine, celastrol, cinnamaldehyde, curcumin, et al. The expression of circRNAs, such as circSATB2 and circFOXM1, were modulated by phytochemicals, and these regulations further affected cell proliferation, apoptosis, migration, invasion, autophagy, chemosensitivity, radiosensitivity and other biological processes. Mechanismly, the circRNAs mainly functioned as miRNA sponge, subsequently affecting miRNA-mediated regulation of target genes and related cell signaling pathways. In this review, we summarized the impact of phytochemicals on circRNAs expression and biological function, and discussed the mechanisms underlying phytochemicals regulating circRNAs in cancer and other chronic diseases.

(PubChem CID: 969516); Emodin (PubChem CID: 3220); Gambogic acid (PubChem CID: 9852185); Genistein (PubChem CID:5280961); Lycorine (PubChem CID:72378); Matrine (PubChem CID:91466); Naringenin (PubChem CID: 932); Non-coding RNAs; Paclitaxel (PubChem CID: 36314); Panax notoginseng saponins (PubChem CID: 297); Phytochemicals; Puerarin (PubChem CID: 5281807); Quercetin (PubChem CID: 5280343); Tanshinone IIA (PubChem CID: 164676).

44. **Traditional Chinese medicine reverses cancer multidrug resistance and its mechanism**

Authors

J Wei [# 1], Z Liu [# 2], J He [1], Q Liu [3], Y Lu [1], S He [1], B Yuan [1], J Zhang [4], Y Ding [5]

Abstract

Chemotherapy is one of the most commonly used clinical treatments among the currently available cancer therapies. However, the phenomenon of Multidrug resistance (MDR) has become a challenge in the treatment process, weakening the impact of chemotherapy. Extensive research on elucidating the development of cancer MDR has identified the following mechanisms that play a critical role in the development of several MDR reversal agents: abnormal expression of cell membrane transporters, adaptation of cancer cells to the microenvironment, regulation of hypoxia, repair of DNA damage and reduction of apoptosis, the enhancement of the EMT process, the existence of cancer stem cells (CSCs), and the abnormal activation of key signaling pathways. However, they failed to demonstrate significant efficacy due to severe side effects during their clinical trials. Traditional Chinese medicines (TCMs) are known to play an important anti-cancer role since they have low toxicity, high efficacy, and safety and can reverse MDR. TCMs reversal agents can be divided into Chinese medicine monomers, synthetic monomers, analogs, or derivatives. Several studies have shown that TCMs can effectively overcome cancer MDR and can be effectively used for treating cancer patients.

45. **Research status and prospects of acupuncture for prevention and treatment of chemo- and radiotherapy-induced salivary gland dysfunction in head and neck cancer**

Authors

Shan-Qiang Zhang [1], Hai-Bin Chen [2], Jun Liu [1], Wen-Jie Dai [1], Qi-Qi Lu [1], Ji-Cheng Li [1] [3]

Abstract

in English, Chinese

Salivary gland dysfunction (SGD) induced by chemo- and radiotherapy for head and neck cancer (HNC) has always been a difficult problem in modern medicine. The quality of life of a large number of HNC patients is severely impaired by SGD such as xerostomia and dysphagia. In recent years, several studies have found that acupuncture can improve patients' salivary secretion, but it has not yet been approved as an alternative therapy for SGD. For this reason, we collected the clinical study reports on acupuncture in the treatment of SGD induced by chemo- and radiotherapy in HNC patients in the past 20 years, and analyzed and discussed the advantages and disadvantages of these studies with respect to tumor types, group setting, intervention modality, acupoints selection, outcome evaluation, and safety. We believed that acupuncture is beneficial for SGD, but the existing objective evidence is insufficient to support its effectiveness. Therefore, improving the Standards for Reporting Interventions in Clinical Trials of Acupuncture, selecting the optimal combination of acupoints through scientific and rigorous study design, and exploring the potential mechanism of acupuncture in the treatment of diseases combined with the meridian theory may be effective ways to promote the acceptance of acupuncture as an alternative therapy for SGD in future. The significance of this review is to provide a reference for researchers to carry out high-quality clinical trials of acupuncture in the treatment of SGD in future from the perspective of the combination of modern medicine and traditional Chinese medicine.

46. **Natural substances derived from herbs or plants are promising sources of anticancer agents against colorectal cancer via triggering apoptosis**

Authors

Zi-Bo Liu [1] , Ting Zhang [1] , Xun Ye [1] , Zi-Qi Liu [1] , Xue Sun [1] , Li-Lin Zhang [1] , Chun-Jie Wu

Abstract

Objectives: Nowadays, one of the most common gastrointestinal cancers is colorectal cancer (CRC). Chemotherapy is still one of the main methods to treat cancer. However, the currently available synthetic chemotherapy drugs often cause serious adverse reactions. Apoptosis is generally considered as an ideal way for induction the death of tumour cells without the body's inflammatory response, and it is reported that lots of natural agents could trigger various cancer cells to apoptosis. The overarching aim of this project was to elucidate the specific mechanisms by which natural substances induce apoptosis in CRC cells and to be used as an alternative therapeutic option in the future.

Key findings: The mechanisms for the pro-apoptotic effects of natural substances derived from herbs or plants include death receptor pathway, mitochondrial pathway, endoplasmic reticulum stress pathway, related signal transduction pathways (PI3K/Akt, MAPK, p53 signalling), and so on.

Summary: This paper updated this information regarding the anti-tumour effects of natural agents via induction of apoptosis against CRC, which would be beneficial for future new drug research regarding natural products from herbs or plants.

47. [**Radix Tetrastigma Extracts Enhance the Chemosensitivity in Triple-Negative Breast Cancer Via Inhibiting PI3K/Akt/mTOR-Mediated Autophagy**](#)

Authors

[Shuo Zhang](#) [1] , [Tongxing Cui](#) [2] , [Yin Duan](#) [1] , [Hongchen Zhang](#) [1] , [Bei Wang](#) [1] , [Huiling Chen](#) [3] , [Junjie Ni](#) [3] , [Yilin Shen](#) [3] , [Xiao-Ai Lv](#) [4]

Abstract

Objective: Drug resistance in tumors is one of the major factors that leads to chemotherapy failure. This study aims to investigate the effect of Radix Tetrastigma extracts (RTEs) on Taxol-induced autophagy and the chemosensitivity against drug resistance in triple-negative breast cancer (TNBC).

Methods: Taxol-resistant MDA-MB-468 (MDA-MB-468/Taxol) cells were induced and treated with RTEs and/or Taxol. Mice were subcutaneously inoculated with MDA-MB- 468/Taxol cells to establish xenograft models. The associated protein levels were measured by western blotting. Flow cytometry, CCK-8 and EdU assay were performed to detect cell apoptosis, viability, and proliferation, respectively.

Results: In MDA-MB-468/Taxol cells, RTEs & Taxol treatment increased cell apoptosis, reduced cell viability and proliferation, up-regulated anti-autophagy marker LC3I/LC3II ratio, and enhanced mTOR level. With RTEs & Taxol treatment, mTOR silencing downregulated LC3I/LC3II ratio, increased cell viability and proliferation, and reduced cell apoptosis, while mTOR overexpression showed the opposite results. PI3K inhibitor reduced AKT and mTOR levels, and the effects on cell activities were similar to the results of mTOR silencing. After RTEs & Taxol injection, xenograft tumor was smaller, and AKT, mTOR, LC3I/LC3II ratio and apoptotic marker cleaved caspase-3 were increased.

Conclusion: RTEs enhanced the chemosensitivity of resistant TNBC cells to Taxol through inhibiting PI3K/Akt/mTOR-mediated autophagy.

Micro: RTEs exerted anti-tumor effects in various cancers, and this study determined its role in TNBC. Taxol-resistant MDA-MB-468 cells were induced and xenograft models were established. We found that RTEs inhibited autophagy of MDA-MB-468/Taxol cells and reduced tumor growth.

Inhibition of PI3K/Akt/mTOR pathway promoted autophagy of MDA-MB-468/Taxol cells. We may provide a new potential strategy for TNBC treatment.

Keywords: Autophagy; Breast cancer; PI3K/Akt/mTOR; RTEs; TNBC.

48. [**Network Pharmacology Analysis of Molecular Mechanism of Curcuma longa L. Extracts Regulating Glioma Immune Inflammatory Factors: Implications for Precise Cancer Treatment**](#)

Authors

Hui Li [1] , Yongwei Li [1]

Abstract

Introduction: Curcuma longa L. has been associated with different antioxidant, antiinflammatory, bactericidal and anticancer effects, but the mechanisms of the effects are not yet clearly understood. This study aimed to investigate the key targets and the effect of potential molecular mechanisms of Curcuma longa L. extracts on glioma using different network pharmacology analysis approaches.

Methods: The components of Curcuma longa were extracted by gas chromatography-mass spectrometry (GC-MS), and the active components related to the occurrence and development of glioma were determined by traditional Chinese medicine systems pharmacology database and analysis platform (TCMSP) database, and the same targets of the active components and glioma were screened by network pharmacology approach. Then, the protein's function and regulatory pathway of the common targets were analyzed by Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analyses. The protein's action and regulatory pathway of the common targets were analyzed with the Cytoscape package using the Search Tool for the Retrieval of Interacting Genes/Proteins (STRING) database to construct the target interaction network through which the key targets were identified.

Results: GC-MS combined with TCMSP database was used to identify the active components related to the occurrence and development of glioma in Curcuma longa. Finally, we identified the active components 1-(1,5-Dimethyl-4-hexenyl)-4-methyl benzene and Zingiberene. At the same time, 190 target genes of Curcuma longa extracts on glioma were obtained using the Venn diagram. The results of GO analysis showed that the biological processes involved included a response to stimulation, metabolic process, inflammatory process, cell differentiation, and regulation of biological processes. KEGG analysis showed that the PI3K-Akt signaling pathway, MAPK signaling pathway, Th17 cell differentiation, and proteoglycan pathway might be involved in cancer. Further analyses showed that the IL-17 signaling pathway and Interleukin-4 and interleukin-13 signaling were involved in the inflammatory pathway. The analysis of key nodes

showed that GSK3B, MAPK14, HSP90AA1, MAPK3 and MAPK8 were IL-17 signaling pathways, while HIF1A and JAK3 were Interleukin-4 and interleukin-13 signaling pathways.

Conclusion: Curcuma longa extracts can regulate the occurrence and development of glioma by regulating the immune-inflammatory responses.

49. **Garlic constituents for cancer prevention and therapy: From phytochemistry to novel formulations**

Authors

Arijit Mondal [1], Sabyasachi Banerjee [2], Sankhadip Bose [3], Sujayita Mazumder [4], Rebecca A Haber [5], Mohammad Hosein Farzaei [6], Anupam Bishayee [7]

Abstract

Garlic (Allium sativum L.) is one of the oldest plants cultivated for its dietary and medicinal values. This incredible plant is endowed with various pharmacological attributes, such as antimicrobial, antiarthritic, antithrombotic, antitumor, hypoglycemic, and hypolipidemic activities. Among the various beneficial pharmacological effects of garlic, the anticancer activity is presumably the most studied. The consumption of garlic provides strong protection against cancer risk. Taking into account the multi-targeted actions and absence of considerable toxicity, a few active metabolites of garlic are probably to play crucial roles in the killing of cancerous cells. Garlic contains several bioactive molecules with anticancer actions and these include diallyl trisulfide, allicin, diallyl disulfide, diallyl sulfide, and allyl mercaptan. The effects of various garlic-derived products, their phytoconstituents and nanoformulations have been evaluated against skin, prostate, ovarian, breast, gastric, colorectal, oral, liver, and pancreatic cancers. Garlic extract, its phytocompounds and their nanoformulations have been shown to inhibit the different stages of cancer, including initiation, promotion, and progression. Besides, these bioactive metabolites alter the peroxidation of lipid, activity of nitric oxide synthetase, nuclear factor-κB, epidermal growth factor receptor, and protein kinase C, cell cycle, and survival signaling. The current comprehensive review portrays the functions of garlic, its bioactive constituents and nanoformulations against several types of cancers and explores the possibility of developing these agents as anticancer pharmaceuticals.

50. **Quality of life in cancer patients with different preferences for nurse spiritual therapeutics: The role of psychological capital**

Authors

[Yu-Fang Guo](#) [1] , [Ke-Fang Wang](#) [1] , [Wendy Cross](#) [2] , [Louisa Lam](#) [2] [3] , [Virginia Plummer](#) [2] [4] , [Jing Li](#) [1]

Abstract

Aim: To explore the status of quality of life and psychological capital and analyse the different effects of psychological capital on the quality of life of cancer patients with different preferences for nurse spiritual therapeutics.

Design: A cross-sectional survey was used.

Methods: Two hundred and eight cancer patients were recruited using convenience sampling from a tertiary Chinese hospital, between March and July 2019. Data on preferences for nurse spiritual therapeutics (PNST), psychological capital (PsyCap) and quality of life (QoL) were collected using paper questionnaires. Hierarchical multiple regression was employed to investigate the different influences of PsyCap on QoL of cancer patients with various levels of PNST.

Results: Compared with patients having high PNST, patients with mild-moderate PNST experienced lower self-efficacy, hope, optimism, PsyCap and social/family well-being. PsyCap significantly explained the variance on QoL of patients with various levels of PNST. Age, gender, presence of caregiver were significant factors influencing physical, social/family and emotional well-being of patients with high PNST.

Conclusion: The present study demonstrates disparities in PsyCap and QoL between cancer patients with mild-moderate and high PNST. It is essential to be aware of the positive influences of PsyCap on QoL and develop effective interventions for patients to improve their QoL, especially for those with mild-moderate PNST.

Impact: It is necessary to realize the benefits of PsyCap on QoL of cancer patients with various levels of PNST. Appropriate training for nurses needs to be developed to promote their spiritual care competencies. Moreover, supportive interventions should be developed for cancer patients to improve their PsyCap and QoL.

[Integrative surgical oncology: A model of acute integrative oncology](#)

51.

Authors

[Maggie L Diller](#) [1] [2] , [Viraj A Master](#) [2] [3]

Abstract

Integrative oncology has emerged as a recognized medical subspecialty because of growing interest in the use of integrative medicine in modern cancer care on behalf of both patients and providers. Acutherapy and mind-body techniques, such as meditation and yoga, have been shown to aid in symptom control and improve quality of life in oncologic patient populations, and the Society of Integrative Oncology and American Society of Clinical Oncology have recently endorsed a set of guidelines for the implementation of these techniques specifically in patients with breast cancer. Although the current guidelines focus largely on the management of chronic symptoms, there exists evidence to support the use of these techniques in acute symptom management as well. With surgical resection representing the backbone of many cancer treatment regimens, symptoms that arise during the perioperative period are prime examples of the acute symptomatology common among patients with cancer. Here, the authors provide a detailed literature review of the current evidence supporting the use of integrative techniques during the perioperative period and demonstrate their applicability for acute symptom management within oncologic and surgical populations. In doing so, the authors introduce a new paradigm of surgical practice they call integrative surgical oncology and integrative surgery.

52. **[Exploring the Effect of Polyphyllin I on Hepatitis B Virus-related Liver Cancer through Network Pharmacology and in vitro Experiments](#)**

Authors

Shuxian Yu [1] [2] , Wenhui Gao [1] , Puhua Zeng [2] , Chenglong Chen [3] , Zhuo Liu [2] , Zhen Zhang [1] , Jiyong Liu [1] [4]

Abstract

Aim and objective: To investigate the effect of Polyphyllin I (PPI) on HBV-related liver cancer through network pharmacology and in vitro experiments, and to explore its mechanism of action.

Materials and methods: Use bioinformatics software to predict the active ingredient target of PPI and the disease target of liver cancer, and perform active ingredient-disease target analysis. The results of network pharmacology through molecular docking and in vitro experiments can be further verified. The HepG2 receptor cells (HepG2. 2. 15) were transfected with HBV plasmid for observation, with the human liver cancer HepG2 being used as the control.

Results: Bioinformatics analysis found that PPI had a total of 161 protein targets, and the predicted target and liver cancer targets were combined to obtain 13 intersection targets. The results of molecular docking demonstrated that PPI had a good affinity with STAT3, PTP1B, IL2, and BCL2L1. The results of the in vitro experiments indicated that the PPI inhibited cell proliferation and metastasis in a concentration-dependent manner (P<0.01). Compared with the

vehicle group, the PPI group of 1.5, 3, and 6 μmol/L can promote the apoptosis of liver cancer to different degrees (P<0.01).

Conclusion: The present study revealed the mechanism of PPI against liver cancer through network pharmacology and in vitro experiments. Its mechanism of action is related to the inhibition of PPI on the proliferation of HBV-related liver cancer through promoting the apoptosis of liver cancer cells. Additionally, in vitro experiments have also verified that PPI can promote the apoptosis of HepG2 and HepG2.2.15 cells.

53. [**Acupuncture for radiation-induced toxicity in head and neck squamous cell carcinoma: a systematic review based on PICO criteria**](#)

Authors

Pierluigi Bonomo [1] , Giulia Stocchi [2] , Saverio Caini [3] , Isacco Desideri [2] , Veronica Santarlasci [4] , Carlotta Becherini [2] , Vittorio Limatola [4] , Luca Giovanni Locatello [5] , Giuditta Mannelli [6] , Giuseppe Spinelli [7] , Carmelo Guido [8] , Lorenzo Livi [2]

Abstract

Purpose: In head and neck squamous cell carcinoma (HNSCC), the potential mitigating effect of complementary medicine interventions such as acupuncture for radiation-induced toxicity is unknown. This study aimed to assess the impact of acupuncture on the incidence and degree of severity of common radiation-induced side effects.

Methods: In accordance with pre-specified PICO criteria, a systematic review was performed. Two electronic databases (Medline and Embase) were searched over a 10-year time frame (01/01/10 to 30/09/20). Patients undergoing a curatively intended, radiation-based treatment for histologically confirmed squamous cell carcinoma of the nasopharynx, oropharynx, larynx, hypopharynx and oral cavity represented the target population of our study. Accurate information on the acupuncture methodology was reported. All included articles were evaluated to identify any potential source of bias RESULTS: Five papers were included in our qualitative analysis, for a total of 633 subjects. Compliance to per-protocol defined schedule of acupuncture sessions was high, ranging from 82 to 95.9%. Most patients (70.6%) were randomly allocated to receive acupuncture for its potential preventive effect on xerostomia. The large heterogeneity in study settings and clinical outcomes prevented from performing a cumulative quantitative analysis, thus no definitive recommendations can be provided.

Conclusions: Although shown to be feasible and safe, no firm evidence currently supports the use of acupuncture for the routine management of radiation-induced toxicity in HNSCC.

54. **Acupuncture for Cancer Survivors**

JAMA Oncol. 2021 Sep 1;7(9):1399. doi: 10.1001/jamaoncol.2021.2514.

Authors

Sajeenth Vishnu K [1] , Riccardo Williams [1] , Ambrutha Sivakumar [1]

No abstract available

Comment in

- Acupuncture for Cancer Survivors-Reply.

  Mao JJ, Baser RE, Panageas KS.

  JAMA Oncol. 2021 Sep 1;7(9):1400-1401. doi: 10.1001/jamaoncol.2021.2520.

  PMID: 34323960No abstract available.

Comment on

- Effectiveness of Electroacupuncture or Auricular Acupuncture vs Usual Care for Chronic Musculoskeletal Pain Among Cancer Survivors: The PEACE Randomized Clinical Trial.

  Mao JJ, Liou KT, Baser RE, Bao T, Panageas KS, Romero SAD, Li QS, Gallagher RM, Kantoff PW.

  JAMA Oncol. 2021 May 1;7(5):720-727. doi: 10.1001/jamaoncol.2021.0310.

  PMID: 33734288**Free PMC article.**Clinical Trial.

55. **Acupuncture for Cancer Survivors-Reply**

JAMA Oncol. 2021 Sep 1;7(9):1400-1401. doi: 10.1001/jamaoncol.2021.2520.

Authors

Jun J Mao [1] , Raymond E Baser [2] , Katherine S Panageas [2]

No abstract available

Comment on

- [Effectiveness of Electroacupuncture or Auricular Acupuncture vs Usual Care for Chronic Musculoskeletal Pain Among Cancer Survivors: The PEACE Randomized Clinical Trial.](#)

  Mao JJ, Liou KT, Baser RE, Bao T, Panageas KS, Romero SAD, Li QS, Gallagher RM, Kantoff PW.

  JAMA Oncol. 2021 May 1;7(5):720-727. doi: 10.1001/jamaoncol.2021.0310.

  PMID: 33734288**Free PMC article.**Clinical Trial.

- [Acupuncture for Cancer Survivors.](#)

  Oura M, Omata F, Nishikawa Y.

  JAMA Oncol. 2021 Sep 1;7(9):1399-1400. doi: 10.1001/jamaoncol.2021.2517.

  PMID: 34323934No abstract available.

- [Acupuncture for Cancer Survivors.](#)

  Vishnu K S, Williams R, Sivakumar A.

  JAMA Oncol. 2021 Sep 1;7(9):1399. doi: 10.1001/jamaoncol.2021.2514.

  PMID: 34323969No abstract available.

56. **[Acupuncture for Cancer Survivors](#)**

JAMA Oncol. 2021 Sep 1;7(9):1399-1400. doi: 10.1001/jamaoncol.2021.2517.

Authors

[Mitsuaki Oura](#) [1] , [Fumiya Omata](#) [2] , [Yoshitaka Nishikawa](#) [3]

No abstract available

57. **[Repeated use of rich pictures to explore changes in subjective experiences over time of patients with advanced cancer](#)**

Authors

[Zarah M Bood](#) [1] , [Michael Scherer-Rath](#) [2] , [Mirjam A G Sprangers](#) [3] , [Liesbeth Timmermans](#) [4] , [Ellen van Wolde](#) [2] , [Sayra M Cristancho](#) [5] , [Fenna Heyning](#) [6] , [Silvia Russel](#) [7] , [Hanneke W M van Laarhoven](#) [1] , [Esther Helmich](#) [8]

Abstract

Background: The combination of verbal and visual tools may help unravel the experiences of advanced cancer patients. However, most previous studies have focused on a specific symptom, at only one moment in time. We recently found that a specific visual tool, originating from systems thinking, that is, rich pictures (RPs), could provide a more comprehensive view of the experiences of patients with advanced cancer.

Aims: To examine whether the repeated use of RPs can make changes in subjective experiences of patients living with advanced cancer visible over time.

Methods and results: We performed a prospective study with a generic qualitative approach that was mostly informed by the process of grounded theory. We invited patients to make an RP twice, at the start of the study, and again after 2 months. Both RP drawing sessions were directly followed by a semi-structured interview. Patients with all types of solid tumors, above the age of 18, and with a diagnosis of advanced, incurable cancer, were eligible. Eighteen patients participated and 15 patients were able to draw an RP twice. In eight RP-sets, considerable differences between the first and second RP were noticeable. Two patterns were distinguished: (1) a change (decline or improvement) in physical health (five patients), and/or (2) a change in the way patients related to cancer (three patients).

Conclusion: RPs are a valuable qualitative research method that can be used to explore the experiences of patients with advanced cancer, not only at a single point in time but also over time.

58. **[Biological effects and mechanisms of matrine and other constituents of Sophora flavescens in colorectal cancer](#)**

Authors

[Meng-Hua Chen](#) [1] , [Yue-Yu Gu](#) [2] , [Anthony Lin Zhang](#) [3] , [Daniel Man-Yuen Sze](#) [4] , [Sui-Lin Mo](#) [5] , [Brian H May](#) [6]

Abstract

The plant Sophora flavescens Ait. has been used in the clinical management of colorectal cancer (CRC). Its constituent compounds, notably the alkaloids matrine, oxymatrine, and sophoridine, have received considerable research attention in experimental models of CRC in vivo and in vitro. This review found that extracts of S. flavescens and/or its constituent compounds have been reported to inhibit CRC cell proliferation by inducing cell-cycle arrest at the G1 phase, inducing apoptosis via the intrinsic pathway, interfering in cancer metabolism, inhibiting metastasis and angiogenesis, regulating senescence and telomeres, regulating the tumour microenvironment and down-regulating cancer-related inflammation. In addition, matrine and oxymatrine reversed multi-drug resistance and enhanced the effects of chemotherapies. These anti-cancer effects were associated with regulation of several cellular signalling pathways including: MAPK/ERK, PI3K/AKT/mTOR, p38MAPK, NF-κB, Hippo/LATS2, TGF-β/Smad, JAK/STAT3, RhoA/ROC, and Wnt/β-catenin pathways. These multiple actions in CRC suggest the alkaloids of S. flavescens may be therapeutic candidates for CRC management. Nevertheless, there remains considerable scope for future research into its flavonoid constituents, the effects of combinations of compounds, and the interaction between these compounds and anti-cancer drugs. In addition, more research is needed to investigate likely drug ligand-receptor interactions for each of the bioactive compounds.

59. [Mindfulness meditation helps younger breast cancer survivors](#)

Author

[Carrie Printz](#)

No abstract available

60. [Ultrasound-Based Drug Delivery System](#)

Authors

[Wei-Wei Ren] [1], [Shi-Hao Xu] [2], [Li-Ping Sun] [1], [Kun Zhang] [3]

Abstract

Cancer still represents a leading threat to human health worldwide. The effective usage of anti-cancer drugs can reduce patients' clinical symptoms and extend life-span survival time. Current anti-cancer strategies include chemotherapy, traditional Chinese medicine, biopharmaceuticals, and the latest targeted-therapy. However, due to the complexity and heterogeneity of tumor, serious side effects may result from the direct use of anti-cancer drugs. Besides, the current therapeutic strategies failed to effectively alleviate metastasized tumors. Recently, ultrasound-mediated nano-drug delivery system has become an increasingly important treatment strategy. Due to its abilities to enhance the efficacy and reduce toxic and side effects, it has become a research hotspot in the field of biomedicine. In this review, we introduced the latest research progress of the ultrasound-responsive nano-drug delivery systems, and the possible mechanisms of ultrasound acting on the carrier to change the structure or conformation, as well as to realize the controlled release. In addition, the progress in ultrasound responsive nano-drug delivery systems will also be briefly summarized.

61. **Aromatherapy Plus Music Therapy Improve Pain Intensity and Anxiety Scores in Patients With Breast Cancer During Perioperative Periods: A Randomized Controlled Trial**

Authors

Chao Deng [1] , Yijia Xie [2] , Yan Liu [3] , Yamin Li [2] , Yangfan Xiao [4]

Abstract

Introduction: To investigate the effect of perioperative aromatherapy (AT) or/plus music therapy (MT) on pain and anxiety level, and the potential mechanism in women experiencing breast cancer surgery.

Methods: A total of 160 patients with breast cancer were randomly assigned in a 1:1:1:1 ratio to receive usual care (UC), AT, MT, or combination therapy (CT) during perioperative periods. Pain intensity and anxiety scores were measured by visual analog scale. Interleukin (IL)-6 and high mobility group box 1 (HMGB-1) were measured by enzyme-linked immunosorbent assay.

Results: There was a significant group effect on pain, anxiety, and IL-6 and HMGB-1 levels, with the greatest improvement occurring in the CT group (P < .001). Compared with the UC group, the AT and MT groups had lower mean changes of pain intensity and IL-6 and HMGB-1 levels, and greater anxiety reduction (P < .001). However, the differences between the AT and MT groups did not reach significance (P > .05).

Conclusion: In patients with breast cancer, perioperative CT achieves greater pain improvement and anxiety reduction and less marked increase in IL-6 and HMGB-1 levels. These results suggest that CT is an acceptable complementary and alternative medicine for breast cancer patients.

62. **Leukemia Chemoprevention and Therapeutic Potentials: Selected Medicinal Plants with Anti-Leukemic Activities**

Author

Ogochukwu Izuegbuna [1]

Abstract

Haematological malignancies account for more than one million cases of all cancers yearly worldwide. While survival has improved due to newer drugs used in their management, relapsed/refractory disease remains a challenge, and treatment modalities come with side effects and morbidities. The management of leukaemias with medicinal plants and their natural products remain a viable option. Numerous studies have shown the potentials and viability of medicinal plants and their natural products as good options against leukaemias. However many of these natural products face peculiar challenges such as low systemic bioavailability, hydrophobic nature and displayed toxicities when given at different pharmacologic doses, while the medicinal plants face the threat of extinction. The development of semi-synthetic analogues and better regulations have helped overcome some of these challenges. This review briefly analyzes four medicinal plants and their different natural products that are used traditionally in the management of cancers, and have been scientifically proven to have some form of activity against leukemia. These plants include *Tanacetum parthenium, Garcinia hanburyi, Scutellaria baicalensis*, and *Combretum caffrum.* This review discusses these medicinal plants and their natural products under the following headings: ethnobotany, phytochemistry, mechanism of action, antileukaemic activity and toxicity.

63. **Proteasome inhibitor MG132 induces apoptosis in human osteosarcoma U2OS cells**

Authors

Han Ki Lee [1] , See-Hyoung Park [2] , Myeong Jin Nam [1]

Abstract

MG132 is a potent, reversible, and cell-permeable 20S proteasome inhibitor and it is derived from a Chinese medicinal plant. The purpose of this study is to investigate the anticancer effects

of MG132 against human osteosarcoma U2OS cells. We first performed MTT and colony formation assays to investigate the anti-proliferative effects of MG132. The results demonstrated that MG132 suppressed the proliferation of U2OS cells. Furthermore, we found that treatment with MG132 increased apoptosis and induced DNA damage in U2OS cells. Additionally, zymography, wound healing, and invasion assays showed that MG132 suppressed the enzymatic activity of matrix metalloproteinases, cell migration, and invasion, respectively of U2OS cells. Furthermore, western blotting assay was performed to investigate the apoptotic signaling pathways in MG132-treated U2OS cells. Our results showed that MG132 downregulated the expression of antiapoptotic proteins, including CDK2, CDK4, Bcl-xL, and Bcl-2, whereas it upregulated the expression of proapoptotic proteins, including p21, p27, p53, p-p53 (ser15, ser20, and ser46), cleaved forms of caspase-3, caspase-7, caspase-9, and PARP, and FOXO3 in U2OS cells. These results demonstrated that MG132 activated apoptotic signaling pathways in U2OS cells. Interestingly, MG132 downregulated the phosphorylation of Akt and Erk. Taken together, our results suggest that MG132 has anticancer effects in U2OS cells. Therefore, MG132 may be a potential therapeutic agent for the treatment of osteosarcoma.

Keywords: FOXO3; MG132; apoptosis; osteosarcoma; proteasome inhibitor.

Oncohistones: a roadmap to stalled development

64.

Authors

Shriya Deshmukh [1], Adam Ptack [2], Brian Krug [3], Nada Jabado [1] [2] [3]

Abstract

Since the discovery of recurrent mutations in histone H3 variants in paediatric brain tumours, so-called 'oncohistones' have been identified in various cancers. While their mechanism of action remains under active investigation, several studies have shed light on how they promote genome-wide epigenetic perturbations. These findings converge on altered post-translational modifications on two key lysine (K) residues of the H3 tail, K27 and K36, which regulate several cellular processes, including those linked to cell differentiation during development. We will review how these oncohistones affect the methylation of cognate residues, but also disrupt the distribution of opposing chromatin marks, creating genome-wide epigenetic changes which participate in the oncogenic process. Ultimately, tumorigenesis is promoted through the maintenance of a progenitor state at the expense of differentiation in defined cellular and developmental contexts. As these epigenetic disruptions are reversible, improved understanding of oncohistone pathogenicity can result in needed alternative therapies.

Keywords: H3; development; differentiation; epigenome; oncohistones.

65. **[Complementary and alternative medicine in children with diffuse intrinsic pontine glioma-A SIOPE DIPG Network and Registry study](#)**

Authors

[Fatma E El-Khouly](#) [1] [2], [Syed M Adil](#) [1], [Maria Wiese](#) [3], [Esther Hulleman](#) [1] [2], [N Harry Hendrikse](#) [4] [5], [Gertjan J L Kaspers](#) [1] [2], [Christof M Kramm](#) [3], [Sophie E M Veldhuijzen van Zanten](#) [1] [2] [6], [Dannis G van Vuurden](#) [1] [2], [SIOPE DIPG Network](#)

Abstract

Introduction: Diffuse intrinsic pontine glioma (DIPG) is a rare and aggressive childhood brainstem malignancy with a 2-year survival rate of <10%. This international survey study aims to evaluate the use of complementary and alternative medicine (CAM) in this patient population.

Methods: Parents and physicians of patients with DIPG were asked to participate in a retrospective online survey regarding CAM use during time of illness.

Results: Between January and May 2020, 120 parents and 75 physicians contributed to the online survey. Most physicians estimated that <50% of their patients used CAM, whereas 69% of the parents reported using CAM to treat their child during time of illness. Cannabis was the most frequently used form of CAM, followed by vitamins and minerals, melatonin, curcumin, and boswellic acid. CAM was mainly used with the intention of direct antitumor effect. Other motivations were to treat side effects of chemotherapy or to increase comfort of the child. Children diagnosed from 2016 onwards were more likely to use CAM (χ^2 = 6.08, p = .014). No significant difference was found between CAM users and nonusers based on ethnicity (χ^2 = 4.18, p = .382) or country of residence (χ^2 = 9.37, p = .154). Almost 50% of the physicians do not frequently ask their patients about possible CAM use.

Conclusion: This survey demonstrates that worldwide, a considerable number of patients with DIPG use CAM. Physicians should be more aware of potential CAM use and actively discuss the topic. In addition, more research is needed to gain knowledge about possible anticancer effects of CAM and (positive/negative) interactions with conventional therapies.

66. **[Real-life drug-drug and herb-drug interactions in outpatients taking oral anticancer drugs: comparison with databases](#)**

Authors

[H Prely](#) [1], [C Herledan](#) [1] [2], [A G Caffin](#) [1], [A Baudouin](#) [1], [V Larbre](#) [1] [2], [M Maire](#) [1], [V Schwiertz](#) [1], [N Vantard](#) [1], [F Ranchon](#) [# 1 2], [C Rioufol](#) [# 3 4]

Abstract

Purpose: Due to polypharmacy and the rising popularity of complementary and alternative medicines (CAM), oncology patients are particularly at risk of drug-drug interactions (DDI) or herb-drug interactions (HDI). The aims of this study were to assess DDI and HDI in outpatients taking oral anticancer drug.

Method: All prescribed and non-prescribed medications, including CAM, were prospectively collected by hospital pharmacists during a structured interview with the patient. DDI and HDI were analyzed using four interaction software programs: Thériaque®, Drugs.com®, Hédrine, and Memorial Sloan Kettering Cancer Center (MSKCC) database. All detected interactions were characterized by severity, risk and action mechanism. The need for pharmaceutical intervention to modify drug use was determined on a case-by-case basis.

Results: 294 patients were included, with a mean age of 67 years [55-79]. The median number of chronic drugs per patient was 8 [1-29] and 55% of patients used at least one CAM. At least 1 interaction was found for 267 patients (90.8%): 263 (89.4%) with DDI, 68 (23.1%) with HDI, and 64 (21.7%) with both DDI and HDI. Only 13% of the DDI were found in Thériaque® and Drugs.com® databases, and 125 (2.5%) were reported with similar level of risk on both databases. 104 HDI were identified with only 9.5% of the interactions found in both databases. 103 pharmaceutical interventions were performed, involving 61 patients (20.7%).

Conclusion: Potentially clinically relevant drug interaction were frequently identified in this study, showing that several databases and structured screening are required to detect more interactions and optimize medication safety.

67. **[Efficacy of *Coccinia grandis* against monosodium glutamate induced hepato-cardiac anomalies by inhibiting NF-kB and caspase 3 mediated signalling in rat model](#)**

Authors

[Arnab Banerjee](#) [1], [Sandip Mukherjee](#) [1], [Bithin Kumar Maji](#) [1]

Abstract

Since prehistoric times *Coccinia grandis* has been used as traditional medicine for various diseases including diabetes, dyslipidemia, metabolic and digestive disorders. Although the rationality of efficacy as natural antioxidants with different bioactive compounds in *Coccinia*

grandis against monosodium glutamate (MSG) induced hepato-cardiac damage remains to be disclosed. Six different solvent extracts of the leaves of *Coccinia grandis* were chosen to evaluate *in vitro* antioxidant and free radical (FR)-scavenging activity. Due to high antioxidant content and FR-scavenging property of ethanol extract of *Coccinia grandis* leaves (EECGL) and presence of different bioactive compounds in EECGL was further tested to evaluate *in vivo* hepato-protective and cardio-protective efficacy against MSG-induced anomalies. MSG-induced dyslipidemia, increased cell toxicity markers altered functional status and histopathological peculiarities of target organs were blunted by EECGL. Additionally, MSG incited increase level of interleukin (IL)-6, tumour necrosis factor (TNF)-α, IL-1β which activates nuclear factor kappa-B (NF-kB) guided inflammation via down regulation of IL-10; impaired redox-homeostasis subsequently promoted inflammation associated oxidative stress (OS) and increased vascular endothelial growth factor (VEGF) which provoked microvascular proliferation related cellular damage. On the contrary, increased lipid peroxidation and nitric oxide promotes reduced cell viability, deoxyribonucleic acid damage and apoptosis via activation of caspase 3. EECGL significantly reduced MSG-induced inflammation mediated OS and apoptosis via inhibition of pro-inflammatory factors and pro-apoptotic mediators to protect liver and heart. Therefore, it can be suggested that EECGL contributed competent scientific information to validate the demands for its use to treat MSG-induced hepato-cardiac OS mediated inflammation and apoptosis from natural origin.

68. **Pilot randomized sham-controlled trial of self-acupressure to manage the symptom cluster of insomnia, depression, and anxiety in cancer patients undergoing chemotherapy**

Authors

Huong Thi Xuan Hoang [1] [2], Alex Molassiotis [3], Choi Wan Chan [3], Anh Hoang Vu [4], Phuc Thanh Bui [5]

Erratum in

- Correction to: Pilot randomized sham-controlled trial of self-acupressure to manage the symptom cluster of insomnia, depression, and anxiety in cancer patients undergoing chemotherapy.

Abstract

Purpose: Current evidence for using self-acupressure to manage the cancer-related symptom cluster of insomnia, depression, and anxiety, while promising, is unknown. This study evaluated the feasibility of self-acupressure to manage this symptom cluster and to explore its potential effectiveness.

Methods: Participants were assigned randomly to three study groups, namely the true acupressure (TAP), the sham acupressure (SAP), and the enhanced standard care group (ESC). Participants in the TAP and SAP groups received a training session on acupressure and were required to practice self-acupressure at home once per day for 28 days. The duration of participant involvement was 8 weeks. Patients completed a Numerical Rating Scale (NRS) for each symptom, the Insomnia Severity Index, the Hospital Anxiety and Depression Scale, and the Functional Assessment of Cancer Therapy-General at baseline (T1), post-intervention (T2, week 4), and post follow-up (T3, week 8).

Results: The results indicated that the intervention had clinical significance in improving the targeted symptoms and quality of life. In the TAP group, the symptom cluster severity was significantly lower than in the other groups at T2 ($p < 0.05$). The insomnia severity and anxiety scores in the TAP and SAP groups were significantly lower than those in ESC at T2 and T3 ($p < 0.05$).

Conclusion: The trial was feasible. The promising results of the study suggest that further testing of self-acupressure is warranted to inform its effectiveness on the targeted symptom cluster in patients with cancer. A placebo effect was evident alongside therapeutic effects.

69. **[Effectiveness of Electroacupuncture or Auricular Acupuncture vs Usual Care for Chronic Musculoskeletal Pain Among Cancer Survivors: The PEACE Randomized Clinical Trial](#)**

Authors

[Jun J Mao](#) [1], [Kevin T Liou](#) [1], [Raymond E Baser](#) [2], [Ting Bao](#) [1], [Katherine S Panageas](#) [2], [Sally A D Romero](#) [3], [Q Susan Li](#) [1], [Rollin M Gallagher](#) [4], [Philip W Kantoff](#) [5]

Abstract

Importance: The opioid crisis creates challenges for cancer pain management. Acupuncture confers clinical benefits for chronic nonmalignant pain, but its effectiveness in cancer survivors remains uncertain.

Objective: To determine the effectiveness of electroacupuncture or auricular acupuncture for chronic musculoskeletal pain in cancer survivors.

Design, setting, and participants: The Personalized Electroacupuncture vs Auricular Acupuncture Comparative Effectiveness (PEACE) trial is a randomized clinical trial that was conducted from March 2017 to October 2019 (follow-up completed April 2020) across an urban academic cancer center and 5 suburban sites in New York and New Jersey. Study statisticians were blinded to treatment assignments. The 360 adults included in the study had a prior cancer diagnosis but no current evidence of disease, reported musculoskeletal pain for at least 3 months, and self-reported pain intensity on the Brief Pain Inventory (BPI) ranging from 0 (no pain) to 10 (worst pain imaginable).

Interventions: Patients were randomized 2:2:1 to electroacupuncture (n = 145), auricular acupuncture (n = 143), or usual care (n = 72). Intervention groups received 10 weekly sessions of electroacupuncture or auricular acupuncture. Ten acupuncture sessions were offered to the usual care group from weeks 12 through 24.

Main outcomes and measures: The primary outcome was change in average pain severity score on the BPI from baseline to week 12. Using a gatekeeping multiple-comparison procedure, electroacupuncture and auricular acupuncture were compared with usual care using a linear mixed model. Noninferiority of auricular acupuncture to electroacupuncture was tested if both interventions were superior to usual care.

Results: Among 360 cancer survivors (mean [SD] age, 62.1 [12.7] years; mean [SD] baseline BPI score, 5.2 [1.7] points; 251 [69.7%] women; and 88 [24.4%] non-White), 340 (94.4%) completed the primary end point. Compared with usual care, electroacupuncture reduced pain severity by 1.9 points (97.5% CI, 1.4-2.4 points; $P < .001$) and auricular acupuncture reduced by 1.6 points (97.5% CI, 1.0-2.1 points; $P < .001$) from baseline to week 12. Noninferiority of auricular acupuncture to electroacupuncture was not demonstrated. Adverse events were mild; 15 of 143 (10.5%) patients receiving auricular acupuncture and 1 of 145 (0.7%) patients receiving electroacupuncture discontinued treatments due to adverse events ($P < .001$).

Conclusions and relevance: In this randomized clinical trial among cancer survivors with chronic musculoskeletal pain, electroacupuncture and auricular acupuncture produced greater pain reduction than usual care. However, auricular acupuncture did not demonstrate noninferiority to electroacupuncture, and patients receiving it had more adverse events.

70. **[Apoptotic effect of β-pinene on oral squamous cell carcinoma as one of the major compounds from essential oil of medicinal plant *Piper rivinoides* Kunth](#)**

Nat Prod Res. 2022 Mar;36(6):1636-1640. doi: 10.1080/14786419.2021.1895148. Epub 2021 Mar 7.

Authors

Thaíssa Queiróz Machado [1], Jessica Regina Sales Felisberto [2], Elsie Franklin Guimarães [2], George Azevedo de Queiroz [2] [3], Anna Carolina Carvalho da Fonseca [1], Ygor Jessé Ramos [2], André Mesquita Marques [4], Davyson de Lima Moreira [4], Bruno Kaufmann Robbs [5]

Abstract

Oral squamous cell carcinoma (OSCC) is the most common type of head and neck malignancy. Research on essential oils (EOs) has shown important cytotoxic and anti-tumor properties, among others. Piperaceae species are rich in EOs and here we highlight *Piper rivinoides* Kunth. We investigated the crude EOs from *P. rivinoides*, their pure major constituents and an enriched fraction with the main EO compounds (EF) as cytotoxic and selective OSCC agents. EOs presented as main compounds (-)-α-pinene, (-)-β-pinene and limonene. EOs showed an IC_{50} lower than all isolated compounds, except for (-)-β-pinene in OSCC cells. The (-)-β-pinene induced cell death with apoptotic characteristics. Commercial standards showed greater selectivity than EOs, and (-)-β-pinene was the most selective among them. EF showed higher selectivity compared to crude EOs and carboplatin, turning it into a good candidate as an anticancer fraction. These results are important for the possible development of new treatments for OSCC.

71. **[Natural products based nanoformulations for cancer treatment: current evolution in Indian research](#)**

Authors

Moumita Kundu [1], Ranabir Majumder [1], Chandan Kanta Das [1], Mahitosh Mandal [1]

Abstract

The use of medicinal plants is as ancient as human civilization. The development of phytochemistry and pharmacology facilitates the identification of natural bioactive compounds and their mechanisms of action, including against cancer. The efficacy and the safety of a bioactive compound depend on its optimal delivery to the target site. Most natural bioactive compounds (phenols, flavonoids, tannins, etc) are unable to reach their target sites due to their low water solubility, less cellular absorption, and high molecular weight, leading to their failure into clinical translation. Therefore, many scientific studies are going on to overcome the drawbacks of natural products for clinical applications. Several studies in India, as well as worldwide, have proposed the development of natural products-based nanoformulations to increase their efficacy and safety profile for cancer therapy by improving the delivery of natural bioactive compounds to their target site. Therefore, we are trying to discuss the development of natural products-based nanoformulations in India to improve the efficacy and safety of natural bioactive compounds against cancer.

72. **[Effects of brief stress management interventions on distress and leukocyte nuclear factor kappa B expression during primary treatment for breast cancer: A randomized trial](#)**

Authors

[Alain Diaz](#) [1] , [Chloe J Taub](#) [2] , [Marc E Lippman](#) [3] , [Michael H Antoni](#) [4] , [Bonnie B Blomberg](#) [5]

Abstract

Background: A randomized controlled trial (RCT) of 5-week stress management interventions teaching cognitive behavioral therapy (CBT) or relaxation training (RT) techniques showed decreases in stress and serum inflammatory markers over 12 months in women undergoing treatment for breast cancer (BCa). To understand the molecular mechanisms involved, we examined the effects of these interventions on the transcription factor NF-κB DNA binding activity in leukocytes in parallel with circulating inflammatory markers, stress management skill efficacy and multiple distress indicators.

Methods: This is a secondary analysis using blood samples of 51 BCa patients (Stage 0-III) with high cancer-specific distress selected from a completed RCT ([NCT02103387](#)). Women were randomized to one of three conditions, CBT, RT or health education control (HE). Blood samples and self-reported distress measures (Affects Balance Scale-Negative Affect [ABS-NA], Impact of Events Scale-hyperarousal [IES-H] and intrusive thoughts [IES-I]) were collected at baseline (T0) and 12-month follow-up (T2). Self-reported distress measures and perceived stress management skills (PSMS) were also measured immediately post-intervention (baseline + 2 months: T1). Repeated measures analyses compared changes in distress and NF-κB expression among conditions, controlling for age, stage of cancer, days from surgery to baseline, and receipt of chemotherapy and radiation. Regression analyses related T0 to T2 change in NF-κB expression with T0 to T1 changes in self-reported PSMS and distress measures. Exploratory regression analyses also associated change in NF-κB expression with change in serum cytokines (IL-1β, IL-6 and TNF-α); and s100A8/A9, a circulating inflammatory marker important in breast cancer progression.

Results: There was a significant condition (CBT/RT, HE)xtime (T0, T2) effect on NF-κB, $F_{(1, 39)}$= 5.267, $p = 0.036$, wherein NF-κB expression significantly increased over time for HE but did not change for RT or CBT. Greater increases in PSMS from T0 to T1 were associated with less increase in NF-κB expression over 12 months ($\beta = -0.426$, $t(36) = -2.637$, $p = 0.048$). We found that women assigned to active intervention (CBT/RT) had significant decreases in ABS-NA ($F_{(1, 40)}$= 6.537, $p = 0.028$) and IES-I ($F_{(1, 40)}$= 4.391, $p = 0.043$) from T0 to T1 compared to women assigned to HE, who showed no change over time (p's > 0.10). For women assigned to CBT or RT, lower NF-κB expression at T2 was related to less ABS-NA, IES-H, and IES-I, all p's < 0.05, although T0-T1 change

in distress was not related to T0-T2 change in NF-κB expression for those in an active intervention.

Conclusions: Brief CBT or RT stress management interventions can mitigate increases in pro-inflammatory leukocyte NF-κB binding over 12 months of primary treatment in highly distressed BCa patients. These effects are likely brought about by improved stress management skills.

73. **Extract of Polygala tenuifolia, Angelica tenuissima, and Dimocarpus longan Reduces Behavioral Defect and Enhances Autophagy in Experimental Models of Parkinson's Disease**

Authors

Huan Li [# 1 2 3], Joonki Kim [# 1], Huynh Nguyen Khanh Tran [1], Chang Hwan Lee [4], Jonghyun Hur [4], Min Cheol Kim [1], Hyun Ok Yang [5 6 7]

Abstract

The 20% ethanol extract of Polygala tenuifolia, Angelica tenuissima, and Dimocarpus longan (WIN-1001X) was derived from a modified version of Korean traditional herbal formula 'Chungsimyeolda-tang' which has been used for the treatment of cerebrovascular disorders. The Parkinson's disease presents with impaired motor functions and loss of dopaminergic neurons. However, the treatment for Parkinson's disease is not established until now. This study aims to elucidate the therapeutic advantages of WIN-1001X on animal models of Parkinson's disease. WIN-1001X administration successfully relieved the Parkinsonism symptoms in 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-induced Parkinson's disease mice tested by rota-rod and pole tests. The loss of tyrosine hydroxylase activities in substantia nigra and striatum was also attenuated by administration of WIN-1001X. In mice with sub-chronical MPTP injections, autophagy-related proteins, such as LC3, beclin-1, mTOR, and p62, were measured using the immunoblot assay. The results were favorable to induction of autophagy after the WIN-1001X administration. WIN-1001X treatment on 6-hydroxydopamine-injected rats also exhibited protective effects against striatal neuronal damage and loss of dopaminergic cells. Such protection is expected to be due to the positive regulation of autophagy by administration of WIN-1001X with confirmation both in vivo and in vitro. In addition, an active compound, onjisaponin B was isolated and identified from WIN-1001X. Onjisaponin B also showed significant autophagosome-inducing effect in human neuroblastoma cell line. Our study suggests that relief of Parkinsonism symptoms and rescue of tyrosine hydroxylase activity in dopaminergic neurons are affected by autophagy enhancing effect of WIN-1001X which the onjisaponin B is one of the major components of activity.

74. **Radioprotective Effects of Plants from the Lamiaceae Family**

Authors

Tomasz M Karpiński [1], Artur Adamczak [2], Marcin Ożarowski [3]

Abstract

Background: Edible and medicinal plants are still an interesting source of promising biologically active substances for drug discovery and development. At a time of increasing cancer incidence in the world, alleviating the bothersome side effects of radiotherapy in debilitated cancer patients is becoming an important challenge.

Objective: The aim of the study was to overview the literature data concerning the radioprotective activity of extracts, essential oils, and some chemical compounds obtained from 12 species belonging to the Lamiaceae family, gathering of numerous spice and medicinal plants rich in valuable phytochemicals.

Results: The analysis of available publications showed radioprotective effectiveness of essential oils and complex extracts containing phenolic acids and flavonoids in various in vitro and in vivo models. Relatively welldocumented preventive properties exhibited the following species: Mentha × piperita, Ocimum tenuiflorum, Origanum vulgare, and Rosmarinus officinalis. However, few plants such as Lavandula angustifolia, Mentha arvensis, M. spicata, Plectranthus amboinicus, Salvia miltiorrhiza, S. officinalis, Scutellaria baicalensis, and Zataria multiflora should be more investigated in the future. Among the mechanisms of radioprotective effects of well-studied extracts and phytochemicals, it can be mentioned mainly the protection against chromosomal damage, scavenging free radicals, decreasing of lipid peroxidation and elevating of glutathione, superoxide dismutase, catalase, and alkaline phosphatase enzyme levels as well as the reduction of the cell death. The plant substances protected the gastrointestinal tract, bone marrow and lung fibroblasts.

Conclusion: The studied species of Lamiaceae family and their active chemical compounds are potent in alleviating the side effects of radiotherapy and should be considered as a complementary therapy.

75. **Spiritual care experiences by cancer patients, their family caregivers and healthcare team members in oncology practice settings: A qualitative study**

Authors

Soolmaz Moosavi [1], Camelia Rohani [2], Fariba Borhani [3], Mohammad Esmaeel Akbari [4]

Abstract

Purpose: Integrating spirituality into the patient care within a healthcare team, increases the ability to provide "holistic care" for cancer patients. The spiritual care experiences of different involved persons can be a guide for future planning. Therefore, this study aimed to explore the spiritual care experiences of hospitalized cancer patients, their family caregivers and healthcare team members in oncology settings.

Methods: This is a descriptive qualitative study which was conducted with 21 participants, who were selected by purposive sampling. Semi-structured interviews were used to collect the data. The data were analyzed with conventional content analysis method.

Results: Two themes of "systematic care" and "caring with paradoxical results" were extracted from the spiritual care experiences of our participants.

Conclusions: Spiritual care as professional, comprehensive, collaborative and artistic care should be provided in a multidisciplinary healthcare team for cancer patients. Otherwise, patients may experience deprivation of spiritual services and consequently, spiritual distress.

76. **Could acupuncture be a treatment option for cancer patients with attitudinal barriers to pharmacological pain management?**

Authors

Jun Kako [1], Kohei Kajiwara [2], Masamitsu Kobayashi [3]

No abstract available

77. **Expanding Our Reach: the Value of Massage Therapists in Melanoma Identification**

Authors

Eliezer C Kinberg [1], Jeffrey Greenwald [2], Janis H Fox [3]

Abstract

Massage therapists are uniquely positioned to identify skin cancer. Seminal work in 2013 revealed that 40% of massage therapists do not receive any training in skin cancer identification (Campbell et al. J Cancer Educ 28:158-164, 2013). Limited work has been published assessing optimal training methodologies to close this educational gap. We present the results of a study in

which students were given access to a 30-min self-driven web-based learning module designed to teach the high yield points of melanoma demographics and clinical features. The students completed pre- and post-testing, the results of which indicated improved knowledge levels and improved confidence in detecting suspected melanoma. We conclude that a 30-min learning module may be sufficient to improve massage therapists' ability and comfort level in identifying melanoma. The ease of delivery of web-based modules may make this an important approach in ensuring that massage therapists receive basic training in skin cancer identification.

78. [**Natural product-based nanoformulations for cancer therapy: Opportunities and challenges**](#)

Authors

Dharambir Kashyap [1], Hardeep Singh Tuli [2], Mukerrem Betul Yerer [3], Ajay Sharma [4], Katrin Sak [5], Saumya Srivastava [6], Anjana Pandey [6], Vivek Kumar Garg [7], Gautam Sethi [8], Anupam Bishayee [9]

Abstract

Application of natural product-based nanoformulations for the treatment of different human diseases, such as cancer, is an emerging field. The conventional cancer therapeutic modalities, including surgery, chemotherapy, immunotherapy, radiotherapy has limited achievements. A larger number of drawbacks are associated with these therapies, including damage to proliferating healthy tissues, structural deformities, systemic toxicity, long-term side effects, resistance to the drug by tumor cells, and psychological problems. The advent of nanotechnology in cancer therapeutics is recent; however, it has progressed and transformed the field of cancer treatment at a rapid rate. Nanotherapeutics have promisingly overcome the limitations of conventional drug delivery system, i.e., low aqueous solubility, low bioavailability, multidrug resistance, and non-specificity. Specifically, natural product-based nanoformulations are being intentionally studied in different model systems. Where it is found that these nanoformulations has more proximity and reduced side effects. The nanoparticles can specifically target tumor cells, enhancing the specificity and efficacy of cancer therapeutic modalities which in turn improves patient response and survival. The integration of phytotherapy and nanotechnology in the clinical setting may improve pharmacological response and better clinical outcome of patients.