Acupuncture for Neoplasms: An Update from the PubMed Database

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ABSTRACT

Background: The therapeutic mainstays of cancer remain surgery, radiotherapy, and chemotherapy. However, radiotherapy and chemotherapy are often associated with serious side-effects, such as nausea and vomiting. Acupuncture has been used widely to treat disorders in clinical practice for at least 3000 years. According to the National Institutes of Health (NIH) Consensus Statement, chemotherapy-induced nausea and vomiting are suitable for acupuncture intervention.

Objectives: The goal of this review is to analyze the applications of acupuncture for treating cancer and to look ahead at the potential advantages of acupuncture for patients with cancer.

Materials and Methods: The PubMed database was searched for articles on acupuncture therapy and neoplasms. The different distributions of scientific papers were analyzed preliminarily.

Results: The articles found showed that acupuncture was used to address various symptoms related to different types of cancer.

Conclusions: The results of clinical trials in acupuncture have provided important clues in oncologic practice. The evidence suggests that acupuncture is a safe and effective therapy for managing cancer and treatment-related symptoms, such as nausea and vomiting and fatigue caused by chemotherapy. As more evidence emerges, the potential advantages of acupuncture in tumor treatment will eventually be clear.

Key Words: Acupuncture, Neoplasms, PubMed database

INTRODUCTION

IN 2012, THERE WERE AN ESTIMATED 3.45 million new cases of cancer and 1.75 million deaths from cancer in Europe. In the European Union, the estimated numbers of new cases of cancer were 1.4 million in males and 1.2 million in females, and ~707,000 men and 555,000 women died from cancer in the same year.¹ According to the results of GLOBOCAN2012, there were 14.1 million new cases and 8.2 million deaths in 2012 worldwide. The most commonly diagnosed cancers were lung (1.82 million), breast (1.67 million), and colorectal (1.36 million); the most common

causes of cancer death were lung cancer (1.6 million deaths), liver cancer (745,000 deaths), and stomach cancer (723,000 deaths).² The therapeutic mainstays of cancer remain surgery, radiotherapy, and chemotherapy. However, radiotherapy and chemotherapy are often associated with serious side-effects, such as nausea and vomiting.

Acupuncture has been used widely to treat disorders in clinical practice for at least 3000 years.³ According to the National Institutes of Health (NIH) Consensus Statement, chemotherapy-induced nausea and vomiting are suitable for acupuncture intervention.⁴ The goal of this review is to analyze the applications of acupuncture for treating cancer

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and to look ahead at the potential advantage of acupuncture for patients with cancer.

MATERIALS AND METHODS

First, the search words in the Medical Subject Headings (MeSH) database were determined. The cancer-related search word was determined as Neoplasms, and the acupuncture-related search word was determined as Acupuncture Therapy. Then the PubMed database was searched with Neoplasms[Majr], Acupuncture Therapy[Majr], and Acupuncture Therapy[Majr] AND Neoplasms[Majr], respectively. The [Majr] in the search query means that the search is restricted to MeSH Major Topics. The time limit was from the beginning of the database to October 28, 2014.

RESULTS

As shown in Figure 1, a total of 2,249,143 articles were found using the search query Neoplasms[Majr], 14,534 articles were found with Acupuncture Therapy[Majr], and 360 articles were found with the search query Acupuncture Therapy[Majr] AND Neoplasms[Majr]. The distribution of these 360 articles is shown in Figure 2. The first article about the topic “acupuncture and tumor” was published in 1970. From 2008 to 2013, >20 articles on this topic were published every year. Among these articles, a total of 79 articles was related to clinical trials. Fifteen articles related to polycystic ovary syndrome (PCOS) were excluded (because PCOS is a nonmalignant condition), and the remaining 64 articles related to cancer are summarized in Table 1.^{5–68} The distribution of these 64 articles according to topics is shown in Figure 3.

DISCUSSION

Although acupuncture has been widely used in China to treat disorders in clinical practice for at least 3000 years, this

FIG. 1. Number of articles retrieved in the PubMed database with the different search queries.

FIG. 2. Yearly distribution of 360 articles retrieved with the search query (Acupuncture Therapy[Majr]) AND Neoplasms[Majr].

TABLE 1. ARTICLES RELATED TO ACUPUNCTURE IN CLINICAL TRIALS^a

<i>Catalogue</i>	<i>Purpose/concerns of acupuncture for tumor in clinic</i>
Breast cancer	Arthralgia related to aromatase inhibitors ⁵⁻⁷ Patient-reported outcomes, receiving aromatase inhibitors ⁸ Aromatase inhibitors-induced arthralgias with early stage breast cancer ⁹ AIMSS ¹⁰ Hot flashes, treated with tamoxifen ¹¹ Managing fatigue and well-being in breast-cancer survivors ¹²⁻¹⁵ Upper-limb circumference with lymphedema ¹⁶ Hot flashes & sleep disturbances ¹⁷ Vasomotor symptoms treated with adjuvant tamoxifen ¹⁸ Vasomotor symptoms ¹⁹⁻²¹ HF&NS, physical and emotional well-being ²² HRQoL Health-related quality-of-life and sleep ²³ Influence of moxibustion with herb on living quality in patients who received chemotherapy ²⁴
Colorectal cancer	Improvement of immune function ²⁵ Warming needle moxibustion & its influence on GI & immune function ²⁶ Reducing duration of postoperative ileus & hospital stay ²⁷ Treatment of ileus after laparoscopic colorectal surgery ^{28,29}
Liver cancer	Wrist-ankle acupuncture, its analgesic effect & abdominal distention ³⁰ Effect in combination with liver artery intubation chemotherapy ³¹
Ovarian cancer	B 6/PC 6 points injection, chemotherapy-induced nausea & vomiting. ³² White blood cell count and absolute neutrophil count, during myelosuppressive chemotherapy. ³³
Cervical carcinoma	Residual urine volume and promoting bladder function recovery ³⁴
Lung cancer	Immune function and QoL ³⁵
Nasopharyngeal carcinoma	Moxibustion, with radio- and chemotherapy ³⁶
Pituitary tumor	Hemodynamics, anesthetic and relevant complications ³⁷
Prostatic carcinoma	Hot flushes after castration therapy ³⁸ Hot flash frequency & intensity, QoL, and sleep quality ³⁹
Pancreatic cancer	Analgesic effect ⁴⁰
Gastrointestinal cancer	Restoration of GI functions ⁴¹ Prevention of postsurgery deep venous thrombosis in elderly patients ⁴² Treatment of stomach carcinoma pain ⁴³
Craniocerebral tumor	Safety and effectiveness of EA combined with general anesthesia for craniocerebral tumor-removal surgery involving cerebral eloquent areas. ⁴⁴ EA preconditioning, S100 calcium-binding protein beta & neuron-specific enolase ⁴⁵ Sevoflurane anesthetic requirement, and the speed of postoperation recovery ⁴⁶
Head-and-neck cancer	Transcutaneous nerve stimulation method, whole saliva production & related symptoms with radiation-induced xerostomia ⁴⁷ Xerostomia among head/neck patients undergoing radiotherapy ⁴⁸⁻⁵¹ Swallowing function and QoL in patients with dysphagia ⁵²
Multiple myeloma	Thalidomide/bortezomib-induced peripheral neuropathy ⁵³
Laryngocarcinoma	General anesthesia with combination of acupuncture & enflurane in radical operation for laryngocarcinoma ⁵⁴
Malignant neoplasm	T-lymphocyte & its subsets ⁵⁵ Interleukin-2 level & NK-cell immunoactivity ⁵⁶ Moxibustion with herb, lymphocyte count ⁵⁷
Incurable cancer	Side-effects ⁵⁸ Auricular point acupressure, chemotherapy-induced nausea & vomiting ⁵⁹ T-cell subpopulations, NK-cell activity, humoral immunity & leukocyte count ⁶⁰ Symptoms, such as nausea & vomiting, caused by chemotherapy ⁶¹ Postchemotherapy fatigue ⁶² Xerostomia ⁶³⁻⁶⁵ Massage & acupuncture, pain & depressive mood ⁶⁶ Chemotherapy-induced peripheral neuropathy ⁶⁷ Cancer-related fatigue, receiving external radiation therapy ⁶⁸

^aThis table contains details from the 64 articles, grouped according to the kinds of cancer that was treated.

AIMSS, aromatase inhibitors-associated musculoskeletal symptoms; HF&NS, hot flashes and night sweats; HRQoL, health-related quality of life; GI, gastrointestinal; QoL, quality of life; EA, electroacupuncture; NK, natural killer;

FIG. 3. Proportional distribution of the 64 articles related to clinical trials.

modality has come under scientific investigation only recently. In 1976, the U.S. Food and Drug Administration (FDA) classified acupuncture needles as investigational devices (Class III),⁶⁹ resulting in a number of research studies on the effectiveness and safety of acupuncture. Taking into account the study period, this trend has been confirmed in acupuncture for cancer-related diseases, and, since 1979, the article numbers have been increasing gradually (Fig. 2). In 1997, the National Institutes of Health (NIH) held a Consensus Development Conference on Acupuncture to evaluate its safety and efficacy. The panel stated that "there is clear evidence that needle acupuncture treatment is effective for postoperative and chemotherapy nausea and vomiting."⁴ The panel also stated that there are "a number of other pain-related conditions for which acupuncture may be effective as an adjunct therapy, an acceptable alternative, or as part of a comprehensive treatment program,"⁴ and agreed that further research is likely to

uncover additional areas in which acupuncture intervention will be useful.

These actions by the FDA and NIH have resulted in the upsurge of acupuncture exploration and the establishment of a number of active programs for acupuncture. This led to a further increase of scientific articles about acupuncture and cancer since 2000 (Fig. 2).

From the literature reports, one can conclude that acupuncture for tumor treatment is a new and challenging field in oncology. From Table 1, it is clear that acupuncture is usually used to deal with the symptoms related to various kinds of cancers. However, there are no clinical trials of acupuncture as a direct cancer treatment. All clinical trials either use acupuncture to alleviate drug side-effects or to relieve symptoms.

The use of acupuncture in this special field can be attributed to the statement of the Consensus Development Conference on Acupuncture.⁴

CONCLUSIONS

The results of clinical trials in acupuncture have provided important clues in oncologic practice. The evidence has suggested that acupuncture is a safe and effective therapy for managing cancer and treatment-related symptoms, such as nausea and vomiting and fatigue caused by chemotherapy. It is expected that, as more evidence continues to emerge, the potential advantages of acupuncture in tumor treatment will eventually be clear.

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DISCLOSURE STATEMENT

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