Seminars in Oncology Nursing, Vol 21, No 3 (August), 2005: pp 190-195

OBJECTIVE:

To review strategies and recommendations to improve utilization of acupuncture treatment for side effects of chemoradiation therapy in cancer centers.

DATA SOURCES:

Research studies and articles, government reports, and author experience.

CONCLUSION:

Recent evidence in clinical research indicates that acupuncture is beneficial for chemotherapy-induced nausea, vomiting, and cancer pain. Other preliminary data also suggests acupuncture might be effective for chemotherapy-induced leukopenia, postchemotherapy fatigue, radiation therapy-induced xerostomia, insomnia, and anxiety. However, the utilization rate of acupuncture remains low despite the wide use of other complementary and alternative medical therapies among cancer patients. This low usage of acupuncture in cancer patients indicates a health care quality issue.

IMPLICATIONS FOR NURSING PRACTICE:

Oncology nurses need to increase their awareness of the available evidence in the use of acupuncture in the supportive care of cancer patients.

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0749-2081/05/2103-$30.00/0
doi:10.1016/j.soncn.2005.04.008

ACUPUNCTURE FOR SIDE EFFECTS OF CHEMORADIATION THERAPY IN CANCER PATIENTS

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IN NOVEMBER 2000, The Leonard P. Zakim Center for Integrated Therapies (Zakim Center, Boston, MA) was officially established at Dana Farber Cancer Institute (Boston, MA), a teaching hospital of Harvard Medical School, to provide complementary therapies to patients. The Zakim Center is named in memory of Lenny Zakim, an advocate for an integrated approach to cancer treatment. The mission of the center is to integrate the practice of complementary therapies into traditional cancer treatments. It currently offers massage therapy, acupuncture, nutritional guidance, Reiki, music therapy, and group meditation. Acupuncture, an ancient medical treatment originating from China, is gaining momentum and acceptance as a valid intervention in medical practice. The National Institute of Health defines acupuncture as "a family of procedures involving stimulation of anatomic locations on the skin by a variety of techniques. The most studied mechanism of stimulation of acupuncture points uses penetration of the skin by thin, solid, metallic needles, which are manipulated manually or by electrical stimulation."[1] Currently, Traditional Chinese Medicine services the most prevalent theoretical framework guiding clinical practice of acupuncture, in which the clinical decisions are mainly based upon the unique clinical patterns that conform to Traditional Chinese Medicine theory. Meanwhile, it has become extremely critical to develop scientific knowledge in acupuncture through basic and clinical research to integrate acupuncture into conventional medical practice.

Recent advances in acupuncture clinical research suggests that acupuncture could provide some clinical benefits for cancer patients with side effects induced by chemoradiation therapy, in-

TABLE 1.
Recent Advances in Acupuncture for Chemoradiation Therapy-Induced Side Effects

Clinical Conditions	Author/Study Design	Major Outcome	Reported Adverse Events	Study Population Features
Chemotherapy-induced nausea and vomiting	Roscoe et al (2003)[3] Randomized controlled multicenter trial (n = 739)	Patients in the acupressure condition experienced less nausea on the day of treatment compared with controls ($P <$ .05)	No adverse events were discussed	85% breast cancer, 10% hematologic neoplasm patients undergoing chemotherapy
Cancer pain	Alimi et al (2003)[4] Randomized, blinded, controlled trial (n = 90)	Pain intensity deceased by 36% at 2 months from baseline in the study group ($P <$ .0001)	No infection was reported; no other adverse events were reported	Patients with chronic peripheral or central neuropathic pain arising after treatment of a cancer
Chemotherapy-induced leukopenia	Chen et al (2004)[5] Randomized controlled trial (n = 56)	WBC count in the study group was significantly higher than that in the control group ($P <$ .05)	No adverse effects were discussed	Patients with non–small cell lung cancer or nasopharynx cancer undergoing chemotherapy
Postchemotherapy fatigue	Vickers et al (2004)[8] Uncontrolled prospective study (n = 37)	The mean improvement from baseline fatigue score was 31.3% (95% CI: 20.6%–41.5%)	No adverse events were reported	Cancer patients who had completed cytotoxic chemotherapy at least 3 weeks previously but complained of persisting fatigue
Radiation-induced xerostomia	Johnstone et al (2001)[9] Uncontrolled prospective study (n = 50)	Response rate as improvement of 10% or better from baseline Xerostomia Inventory (XI) was 70%; 48% of patients received benefit of 10 points or more on the XI	No adverse effects were reported	Patients with pilocarpine-resistant xerostomia after radiotherapy for head and neck cancer
Insomnia	Spence et al (2004)[13] Uncontrolled prospective study (n = 18)	A significant nocturnal increase in endogenous melatonin secretion (P = .002); significant improvements in polysomnographic measures of sleep onset latency (P = .003), arousal index (P = .001), total sleep time (P = .001), and sleep efficiency (P = .002).	No adverse events were discussed	Non-cancer patients with insomnia for more than 2 years and to score above 50 on the Zung Anxiety Self Rating Scale

cluding nausea and vomiting,[2,3] pain,[4] leukopenia,[5-7] postchemotherapy fatigue,[8] xerostomia (dry mouth),[9-12] and possibly insomnia and anxiety[13] (Table 1).

After the National Institute of Health Consensus Conference on Acupuncture in 1997, several well-designed clinical trials have generated promising results. A high-quality randomized controlled trial has further confirmed acupuncture antiemesis effect on patients with chemotherapy,[2] with a significant reduction of mean emesis episodes (5 *vs* 15; $P <$ .001) compared with pharmacotherapy alone. The results of the study conformed with the National Institute of Health consensus statement in acupuncture: "There is clear evidence that needle acupuncture is efficacious for adult postoperative and chemotherapy nausea and vomiting and probably for the nausea of pregnancy."[1] In addi-

tion to the use of acupuncture needles for chemotherapy-related nausea, acupressure wrist bands have shown positive results in controlling chemotherapy-induced nausea and vomiting in a large multicenter study.[3] However, another study indicated that using invasive needle acupuncture at P6, an anti-emesis point, showed no additional effect for the prevention of acute nausea and vomiting in high-dose chemotherapy, compared with non-skin-penetrating placebo acupuncture.[14]

In the area of pain management, a randomized placebo-controlled trial showed that auricular acupuncture is very effective for cancer patients with various constant neuropathic pains.[4]

Although there is an absence of medical literatures in English language on acupuncture for leukopenia, several randomized controlled clinical trials conducted in China have suggested that acupuncture could be effective to partially prevent bone marrow suppression-related leukopenia in patients undergoing chemotherapy.[5-7]

Several prospective pilot trials have shown that acupuncture could benefit patients with chemotherapy-related fatigue and severe dry mouth after head and neck radiation therapy.[8-12] Although conducted in non-cancer patients, a study has found acupuncture could significantly reduce insomnia and anxiety,[13] with clear objective improvements in nocturnal melatonin secretion and in polysomnographic measures.

An important criterion to evaluate a therapy in clinical practice is the safety record of the therapy. Several studies on safety of acupuncture have confirmed that acupuncture is a safe procedure in the hands of competent practitioners.[15-17] One large study found that only 43 minor adverse events were associated with 34,407 treatments and no serious adverse events were reported.[18] Based on the criteria proposed by a research team at Harvard Medical School,[19] in which the clinical effectiveness and the risk ratios of complementary and alternative medical (CAM) therapies are simultaneously weighed, acupuncture for chemotherapy-related nausea and vomiting and for pain have been categorized as "accept (may consider recommending) and monitor."[19]

Despite the wide use of CAM therapies among cancer patients, acupuncture use in this population remains low. The prevalence of use of CAM ranges from 48% to 83% among cancer patients in several studies.[17,20-22] However, the acupuncture usage rate was not reported in many CAM surveys.[20,23,24] One recent study found that among insured cancer patients in Washington State, the acupuncture usage was only 1.7% in the year 2000.[25] Another recent survey among 1,065 Chinese women with breast cancer found that although 98% of patients had used at least one form of CAM therapies, the utilization rate of acupuncture was only 4.9%.[26] Similar findings were reported by Ganz et al[27] (2.2%) and Burstein et al[28] (4.0%). The highest utilization rate of acupuncture in cancer patients was reported by Morris et al[29] as 31% of 617 responses. The use of acupuncture is highly associated with the economic status of patients because it requires patients to consult a CAM practitioner whose services are generally not covered by health insurance companies.[22] Few cancer centers in the United States have provided clinical acupuncture service for their patients. The lack of referral from clinicians and the need to self-pay for the service are considered the two main barriers for using acupuncture service.

Increasing Utilization of Acupuncture Services for Cancer Patients is a Health Care Quality Issue

According to the Institute of Medicine's definition,[30] "Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." Health care quality problems are generally classified as underuse, overuse, and misuse. Underuse is the failure to provide a health care service when it would have produced a favorable outcome for a patient. In this case, using acupuncture to reduce side effects of chemoradiation therapy in cancer patients is considered an underuse problem. By failing to provide acupuncture service, patients who are undergoing chemotherapy would unnecessarily suffer from frequent vomiting and nausea and would have to endure cancer pain or the side effects of many analgesic medicines. Therefore, the quality of life of cancer patients is compromised.

The Institute of Medicine has strongly suggested that health care should emphasize the six specific aims for improvement: safe, effective, patient-centered, timely, efficient, and equitable.[31] By examining acupuncture services for cancer patients with chemoradiation therapy, we find that the improvement of the underuse of acupuncture would match these aims well.

Safety

Patient safety is defined as freedom from accidental injury. Acupuncture has been shown as a safe procedure with minimal risk of serious adverse events. Based on Leape's work[32] on hazardous categories crossing various industries, acupuncture use would fall into the category of ultrasafe practice (number of fatalities to encounters less than 1 per 100, 000).

Effectiveness

Evidence-based practice means the integration of best research evidence with clinical expertise and patient values. Seeking the best available clinical evidence relevant to certain clinical questions, especially in the area of acupuncture practice, indicates a need that not only applies evidence from English sources but from all other language sources, including Chinese because a large body of clinical evidence is published in those non-English medical journals. The preliminary evidence on acupuncture effects on chemotherapy-induced leukopenia is a good example.

At the Zakim Center, our practice model of acupuncture is guided by a standardized; biomedical evidence-based approach, supplemented with Traditional Chinese Medicine theoretical framework and the practitioner's personal clinical experience.

Patient-centeredness

The recent movement of CAM in the US population is clearly a signal that health care needs to respect the patient's values, preferences, and expressed needs. The use of acupuncture in cancer patients partially fulfills these needs of patients. Therefore, it is considered patient-centered practice because it provides physical comfort (relaxation during treatment) and emotional support (patient empowerment), in addition to its therapeutic benefits.

Strategy for Quality Improvement Intervention in Acupuncture Use

Based on "Ten Simple Rules" proposed by the Institute of Medicine for quality improvement,[31] we recommend the following measures to improve the utilization of acupuncture for reducing side effects of chemoradiation therapy. These recommendations reflect these simple rules: continuous healing relationship, patient needs, sharing knowledge, the free flow of information, evidence-based decision making, and cooperation among clinicians. The overall goal of the interventions is to increase the use of acupuncture as a valid supportive care in medical cancer centers. The improvement process requires solid and proven clinical evidence to reduce the resistance of clinicians who would refer their patients for acupuncture treatment.

First, *collection of evidence*: all related clinical research articles regarding acupuncture use in cancer patients should be collected from peer-reviewed medical journals, including non-English language journals if possible.

Second, *synthesis of evidence*: (1) generate review articles based on available clinical research. (2) Develop a standardized clinical guideline on acupuncture use in cancer patients with chemoradiation therapy.

Third, *dissemination of evidence* among clinicians and patients: (1) periodically send out concise e-mails regarding current evidence on acupuncture use in cancer treatment to all oncologists, nurses, and other clinical staff in the medical network to remind them of the existence and availability of acupuncture service for their patients. Clinical research from high impact medical journals like *JAMA* or *Cancer* needs to be highlighted. (2) Provide slide presentations at clinical meetings of specialized disease centers. Oncologists, nurses, and other clinical staff need to be given the opportunity to raise questions, concerns, and discussion related to these findings and treatment guidelines. (3) A letter from the medical director of the acupuncture unit could be mailed to all current patients discussing the benefits of acupuncture use for patients who are undergoing chemoradiation therapy. The New Patient Coordinator could introduce the acupuncture service to each new patient when scheduling an appointment. Similar information could be included in the New Patient Guide and patients should be encouraged to discuss the benefits of acupuncture with their physicians and nurses during their treatment.

Fourth, *feedback of treatment*: detailed patient history, progress notes, and treatment procedures should be timely documented in the electronic medical record system so that physicians and nurses are able to review their patient's response to acupuncture treatment through the electronic medical record system.

Fifth, *explore new evidence*: whenever possible, submit data for analysis and conduct clinical stud-

ies on acupuncture use in reducing side effects of chemoradiation therapy in cancer patients. Funded clinical studies would involve active participation of oncologists, nurses, and other clinical staff. The results of the studies should be shared with clinical staff and patients as well as prepared for publication in professional journals.

Reducing the barriers to implementing the proposed strategies involve gaining organizational support in resource allocation and the environmental effect of payment method incentives to cover acupuncture service as a valid medical intervention. Adequate resources from the institute would facilitate the gathering of evidence needed to reduce the referral barrier from clinicians. Change of financial incentive in insurance payment would facilitate the patient access to acupuncture service. These two measures, in concert with the efforts on the part of acupuncture practitioners to promote collection, synthesis, and dissemination of evidence, will gradually lead to increased utilization of acupuncture with cancer patients.

Conclusion

Emerging evidence shows that acupuncture is an effective and safe intervention in treating certain side effects of chemoradiation therapy in cancer patients. The underuse of acupuncture in patients with cancer is a quality-of-care issue resulting from (1) failure in the collection and dissemination of available evidence; (2) exploration of new evidence accepted by the medical community; and (3) lack of incentives for payment methods to access acupuncture service for patients with cancer. The current practice of the Zakim Center at Dana Farber Cancer Institute provides a test field to improve quality of care by suggesting actively disseminating available scientific evidence, exploring new evidence, and changing payment methods. Consequently, the quality of care in acupuncture service as an important component of the supportive care team in cancer centers would be eventually improved.

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