



Science Press

Contents lists available at ScienceDirect

Journal of Integrative Medicine

journal homepage: www.jcimjournal.com/jim
www.journals.elsevier.com/journal-of-integrative-medicine



Case Report

Home care with acupuncture increased the quality of life in a patient with advanced cancer with neuropathic pain induced by bone metastasis: a case report



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ARTICLE INFO

Article history:

Received 12 December 2017

Accepted 27 March 2018

Available online 12 April 2018

Keywords:

Acupuncture

Case report

Cancer

Neuropathic pain

Quality of life

Hospice care

Palliative care

ABSTRACT

A 66-year-old female patient was diagnosed with hepatocellular carcinoma accompanied by neuropathic pain induced by a metastatic tumor that compromised root and spinal canal. Although her pain was relieved following medical treatment, breakthrough pain occurring 1–2 times a day was still distressing. Neuropathic pain in her right lower limb caused discomfort and irritability and decreased her quality of life. We had limited options to adjust her prescription drug regime, due to the side effect of these drugs. Although acupuncture therapy was only performed at her home once a week, the efficacy was outstanding. The patient did not report any further instances of breakthrough pain, and she did not require additional bolus morphine. She could comfortably live in her familiar surroundings with her family and did not require any emergency room visits or admission into the hospital during the last month of her life. She had excellent quality of life in the terminal period of her life, and could even participate in a family function during this time. The present case report suggests that acupuncture may have a role in treating neuropathic pain induced by bone metastasis in patients with advanced cancer across clinical and in-home settings.

Please cite this article as: Su CF. Home care with acupuncture increased the quality of life in a patient with advanced cancer with neuropathic pain induced by bone metastasis: a case report. *J Integr Med*. 2018; 16(3): 208–210.

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1. Introduction

Neuropathic pain is defined as “pain arising as a direct consequence of a lesion or disease affecting the somatosensory system” [1]. Patients usually describe the pain as shooting, lancinating or burning [2]. Neuropathic pain can be caused by many different diseases (e.g., diabetes mellitus, herpes zoster, human immunodeficiency virus (HIV) infection and post-stroke), medical interventions (e.g., chemotherapy and surgery), and injuries (e.g., brachial plexus avulsion and spinal cord injury) [3]. Neuropathic pain impairs patients’ health-related quality of life, including important aspects of physical and emotional functioning, such as mobility and ability to work and maintain social contact [4–8]. Treating neuropathic pain is challenging. Medical treatment options include administration of tricyclic antidepressants (TCA), serotonin-norepinephrine reuptake inhibitors (duloxetine and

venlafaxine), calcium channel $\alpha 2\text{-}\delta$ ligands (gabapentin and pregabalin), topical lidocaine, opioid analgesics, tramadol or combination therapy. Other treatment options, including administration of other antidepressants (bupropion, citalopram and paroxetine), *N*-methyl-D-aspartate receptor antagonists, antiepileptic drugs (carbamazepine, lamotrigine, oxcarbazepine, topiramate and valproic acid), topical capsaicin, dextromethorphan, memantine and mexiletine, may relieve neuropathic pain in certain cases [3,9].

Among patients with cancer, approximately 20% of cancer-related pain is neuropathic in the original tumor and approximately 40% of patients have neuropathic pain, which is usually difficult to control [10]. Neuropathic pain in patients with cancer may be directly caused by cancer, cancer treatments or comorbid disease. Neuropathic pain is typically due to a combination of inflammatory, neuropathic, ischemic, infiltrative and compressive mechanisms involving one or more anatomic sites [11]. Patients with neuropathic pain commonly complain that it significantly affects their quality of life, sleep, and mood. Because neuropathic pain is difficult to control, several interventional procedures (e.g.,

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nerve blocks and neurosurgical approaches) and cannabinoid use have also been considered in patients with cancer and neuropathic pain [9].

Acupuncture is a complementary and alternative medicine developed in Chinese medicine. It is a treatment method based on influencing the body by inserting needles at specific points (acupoints) on the human body, and can effectively treat several conditions. In 2003, the World Health Organization published a report summarizing clinical trials that studied the effectiveness of acupuncture. In this report, more than 100 indications, including pain relief, were discussed [12]. Moreover, some studies have confirmed the effectiveness of acupuncture for neuropathic pain induced by spinal cord injury, drugs, HIV infection, and peripheral neuropathy [13–16]. Further, a systematic review and meta-analysis revealed the effectiveness of acupuncture for cancer-related pain relief [17]. Thus, we hypothesized acupuncture to be effective for controlling neuropathic pain induced by bone metastasis and for increasing the quality of life in a patient with advanced cancer.

2. Case report

This study reports a case of a 66-year-old female patient with history of chronic hepatitis C virus infection and hypertension. She was diagnosed with hepatocellular carcinoma (cT1N0M0) 2 years prior to admission. She underwent radiofrequency tumor ablation once and transarterial embolization three times. However, lower back pain was noted at approximately 1 year prior to admission, and magnetic resonance imaging revealed a metastatic tumor over S1 compromised of right root and spinal canal over L5/S1 level. She received local radiotherapy and target therapy using sorafenib; however, her condition did not improve. After discussion with the patient and her family, it was revealed that the patient participated in the MK3475-240 clinical trial in another hospital for 6 months prior to admission. However, following the detection of lung metastasis via computed tomography 3 months prior to admission, she withdrew from the clinical trial and received immunotherapy four times, without significant effect. Owing to persistent pain in her right lower leg with a pain score ranging from 7 to 10 (numerical rating scale, from 0 to 10; 0 means no pain and 10 means worst possible pain), she was admitted to our hospital for pain control, hospice and palliative care.

Following admission, neuropathic pain was noted in her right lower limb as a feeling of electric shock. Some days after admission, her pain score was lowered to 2–3 most of the time, following the medical prescription of (1) continuous daily intravenous morphine (120 mg) and betamethasone (8 mg) injections, (2) gabapentin administration (300 mg) three times a day, (3) diclofenac (75 mg) once a day, and (4) imipramine (10 mg) after breakfast and after dinner (25 mg). However, she still complained of breakthrough pain (a surge of intense pain that breaks through stable around-the-clock analgesia, often found in patients with cancer) in her right lower leg two to three times a day, with a pain score ranging from 5 to 8. Subcutaneous morphine injection (20 mg) was administered to treat the breakthrough pain, but dizziness was noted after a bolus of morphine. In addition, she exhibited irritable mood during admission. She requested the interventional procedure of nerve block. However, this was not arranged because the anesthesiologist believed it would not be significantly effective for this patient. Next, the patient requested home care; thus, continuous intravenous morphine injections were replaced with transdermal fentanyl (100 µg/h) and oxycodone (30 mg every 12 h). Moreover, intravenous betamethasone injection was replaced with dexamethasone (4 mg two times a day). She was discharged with the above prescription on the 19th day after admission.

Our medical team (one doctor and one nurse) visited the patient at her home three days after discharge. She complained of breakthrough pain 1–2 times a day with a pain score ranging from 5 to 8, and subcutaneous morphine injections (20 mg) were delivered four times since hospital discharge. Poor appetite and low spirit were also noted. She agreed to our recommendation of acupuncture as a complementary therapy to treat neuropathic pain. One week later, acupuncture needles were delivered to her home and acupuncture was performed by a doctor at the following acupoints: Ju liao (GB29), Huan tiao (GB30), Yang ling quan (GB34), Qiu xu (GB40), Wei zhong (BL40), and Zu san li (ST36). We chose acupoints according to the range of pain (acupoints of gallbladder meridian) and clinical experience (ST36 for invigorating qi). Manual acupuncture was performed, and needles were inserted into those acupoints until the patient had the sensation of aching or distension (two types of de qi). The needles were retained at each acupoint for 15 min. In addition, due to drowsiness during the daytime, imipramine (10 mg) was discontinued in the morning. This acupuncture therapy was performed once a week during home care.

3. Results

On day 7 following the therapy, the patient reported good appetite, mood and spirit during this week, and no extra morphine was administered. On day 14 following the therapy, her appetite remained fair. On day 21 following the therapy, poor activity and purpura were noted bilaterally over legs. However, no additional morphine was administered. Moreover, dexamethasone was withheld due to the appearance of moon face. On day 27 following the therapy, the patient reported good enough mood, spirit, activity and appetite to participate in a family function for 3 h. However, the next day she exhibited disturbance of consciousness and hypotension and expired at home near midnight. However, no painful facial expressions were noted by her family, and no additional morphine was administered before her death.

4. Discussion

Here, we report that neuropathic pain induced by a metastatic tumor decreased the quality of life. Although her pain was relieved by medical treatment, breakthrough pain occurring 1–2 times a day was still distressing, and side effects of bolus morphine were also reported. Thus, we considered acupuncture which is safe, cheap, effective, easy, and minimally invasive, with no severe reported side effects and can be easily performed at home.

Although acupuncture therapy was just performed once a week, the efficacy was outstanding. The patient did not report any instances of breakthrough pain, and she did not require additional bolus morphine. Although TCA dose was decreased to address daytime drowsiness, pain control remained the same. Importantly, her mood, spirit, and appetite improved. She could comfortably live in her familiar surroundings with her family and did not require an emergency room visit or admission into the hospital during the last month of her life. She could even participate in a family function. She had excellent quality of life in the terminal period of her life. Overall, in this case, the efficacy of acupuncture exceeded our expectations.

Although the mechanisms of acupuncture therapy remain unclear, in the case, possible mechanisms of action for the acupuncture therapy are: (1) afferent fibers (A β , A δ and C) are activated; (2) some signal molecules (such as opioid peptides, glutamate, 5-hydroxytryptamine and cholecystokinin octapeptide) are increased [18]. The definite mechanism needs more research to confirm.

According to our clinical judgement, the patient had symptoms of qi stagnation and blood stasis in the theory of traditional Chinese medicine, and pain she experienced was over the gallbladder meridian. So, acupuncture might have the efficacy in promoting qi and activating blood of the gallbladder meridian. Acupoint of ST36 with the effect of invigorating qi could also help promoting qi and activating blood [19].

This is the first report of using home care with acupuncture in the treatment of neuropathic pain induced by bone metastasis in patient with advanced cancer. Home care can help terminal patients increase their quality of life by living in their familiar surroundings with comfort. Since acupuncture can be easily performed in the home, and has efficacy in managing neuropathic pain induced by bone metastasis, it provides a valuable option to increase the quality of life in this population.

There are several limitations to this report that prevent drawing strong conclusions. First, this is only a case report and more evidence is required (randomized clinical trials and case series) to confirm the efficacy of acupuncture in patients with advanced cancer and neuropathic pain induced by bone metastasis. Second, although we considered that the patient had excellent quality of life due to her good mood, spirit and appetite, we did not use objective tools (EORTC QLQ-C30, Palliative Care Quality of Life Instrument, Hospice Quality of Life Index, etc.) to evaluate her quality of life [20–22]. Similarly, objective measures of pain were not administered following discharge. But breakthrough pain and use of additional morphine were objectively assessed. Third, we visited the patient at her home and performed acupuncture therapy once a week. The patient may have received other therapy that she did not report to us. This might affect the observed efficacy of acupuncture.

The present case report suggests that home care with acupuncture may have a role in increasing the quality of life in the patients with neuropathic pain induced by bone metastasis. However, this result needs more evidence for confirmation. This case report provides useful information for future research regarding acupuncture in hospice home care.

Conflict of interest

There is no conflict of interest.

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