JTCM
中医杂志
Journal of Traditional Chinese Medicine

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J Tradit Chin Med 2018 June 15; 38(3): 439-446
ISSN 0255-2922

RESEARCH ARTICLE

Effect of scar-producing moxibustion at the acupoints Zusanli (ST 36) and Feishu (BL 13) on neutrophil-to-lymphocyte ratio and quality of life in patients with non-small-cell lung cancer: A randomized, controlled trial

Zhang Mengxue, Guan Ling, Wang Lili, Li Ying

Zhang Mengxue, Guan Ling, Wang Lili, Li Ying, Department of Acupuncture and Moxibustion, Chinese People's Liberation Army General Hospital, Beijing 100853, China

Supported by the National Nature Science Foundation of China (No. 81273848)

Correspondence to: Prof. Guan Ling, Department of Acupuncture and Moxibustion, Chinese People's Liberation Army General Hospital, Beijing 100853, China. guanling301@sina.com

Telephone: +86-10-66937410

Accepted: March 17, 2017

Abstract

OBJECTIVE: To evaluate the effect of heat stimulation *via* scar-producing moxibustion at the acupoints Zusanli (ST 36) and Feishu (BL 13) on the neutrophil-to-lymphocyte ratio (NLR) and quality of life in patients with non-small-cell lung cancer (NSCLC).

METHODS: Seventy patients with NSCLC were randomly assigned into two groups: group A received scar-producing moxibustion at the acupoints Zusanli (ST 36) and Feishu (BL 13) every day for 6 weeks, while group B received no intervention (control group). Outcome measures were the NLR and the scores from the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30). The NLR and the EORTC QLQ-C30 were assessed at baseline and at the end of 6 weeks.

RESULTS: Five participants dropped out, leaving a final total of 65 participants who completed the trial. Groups A and B had a similar mean NLR at baseline. After the treatment course, the NLR in group A was significantly lower than that in group B ($P < 0.001$). Compared with group B, the EORTC QLQ-C30 scores in group A were significantly greater in terms of global health status or quality of life ($P < 0.001$) and function ($P < 0.05$), and significantly lower in terms of symptoms ($P < 0.05$).

CONCLUSION: The present study suggests that performing scar-producing moxibustion by heat-stimulating the acupoints Zusanli (ST 36) and Feishu (BL 13) effectively decreases the NLR and improves the quality of life in patients with NSCLC.

Keywords: Carcinoma, non-small-cell lung; Scarring moxibustion; Point ST36 (Zusanli); Point BL13 (Feishu); Immunity; Neutrophils; Lymphocytes; Quality of life; Randomized controlled trial

INTRODUCTION

Lung cancer has become the most common cause of cancer-related death worldwide, with a 5-year survival rate of less than 17%.[1,2] Lung cancer can be categorized into small-cell lung cancer and non-small-cell lung cancer (NSCLC), with the latter accounting for approximately 80% of all lung cancer cases. The primary treatment for early-stage lung cancer is lobectomy, while adjuvant chemotherapy or radiotherapy is performed in inoperable cases or after lobectomy. Despite improve-

ments in conventional cancer therapies, patients with NSCLC still have a poor 5-year survival rate, and their quality of life (QoL) usually dramatically declines because of the side effects of chemotherapy and radiotherapy.[2]

Scar-producing moxibustion is an ancient Chinese treatment method that is currently used to treat complicated and refractory diseases, including NSCLC.[3-5] Numerous experimental studies and randomized clinical trials have shown that moxibustion can improve many aspects of immunity, such as by activating natural killer cells and cytokines (interleukin-1 and interleukin-2), and increasing the quantity of lymphocytes.[6-10] It is well known that the immune system can affect many aspects of malignancy, including migration, invasion, and metastasis.[11-14]

As a protective mechanism involving the immune system, in fl amm ation is now considered the seventh hall-mark of cancer.[15] The systemic inflammatory response reflects the promotion of malignant tumors, and has prognostic value for survival in patients with various solid tumors.[16-20] The neutrophil-to-lymphocyte ratio (NLR) is an easily derived marker of systemic inflammation, and it has been proved that higher NLR values are associated with poorer survival in patients with NSCLC.[21-29]

Controlling the malignant inflammation in patients with NSCLC may improve their QoL. Suppression of such inflammation may be achieved via scar-producing moxibustion, which is a complementary treatment method that regulates the immune system. However, to date, few studies have investigated the association between scar-producing moxibustion and inflammatory markers affecting the QoL in patients with NSCLC. The present study aimed to evaluate the effect of scar-producing moxibustion on patients with NSCLC by assessing the NLR and the scores obtained using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30).[30, 31]

METHODS

Patients

In the present study, 70 patients were recruited from the Department of Thoracic Surgery, Cancer Center, Department of Traditional Chinese Medicine, and the Acupuncture-Moxibustion Center of the Chinese People's Liberation Army (PLA) General Hospital from January 1, 2015 to March 1, 2015. The present study was approved by the Ethics Committee of the Chinese PLA General Hospital, and all included patients provided written informed consent. NSCLC was diagnosed according to the Non-Small Cell Lung Cancer Practice Guidelines[32] revised by the National Comprehensive Cancer Network in 2014. Inclusion criteria were: (a) NSCLC diagnosed by specialists according to histopathologic examination findings; (b) completed lobectomy; (c) completed postoperative adjuvant chemotherapy or radiotherapy; (d) willing participation in the present study. Exclusion criteria were: (a) uncertain diagnosis; (b) inoperable cases; (c) currently undergoing chemotherapy or radiotherapy; (d) advanced disease, such as malignant pleural effusion and involvement or distant metastasis; (e) diabetes mellitus, dermatosis, or other diseases affecting the ability to heal; (f) undergoing repeat surgery or chemotherapy/radiotherapy during the study period; (g) participation in other clinical trials; (h) pregnancy or lactation.

Randomization and blinding

A computerized randomization program (SPSS for Windows, version 21.0; IBM Corp, Armonk, NY, USA) was used to randomly assign the 70 patients to either group A to receive scar-producing moxibustion (n = 35 patients), or to group B to receive no intervention (n = 35 patients). The study was completed by a total of 33 patients in group A, and 32 patients in group B.

All the outcome measures were assessed by an independent investigator who was blinded to the treatments.

Interventions

The bilateral Zusanli (ST 36) acupoints were located four transverse fingerlengths lateral to the 'knee eyes', and bilateral Feishu (BL 13) were located 1.5 transverse fingerlengths lateral to the spinous processes of the 12th thoracic vertebra. With the patient in supine position, 5 mg of delicate moxa was put on bilateral Zusanli (ST 36) and lit by an incense stick. After the first moxa cone was burnt out, another moxa cone was put on the acupoint and lit; this process was repeated nine times. The procedure was then repeated on bilateral Feishu (BL 13).

Group A received moxibustion treatment at all four acupoints once daily for 6 weeks. Group B received no treatment, and were just followed up every week for 6 weeks.

Outcome measures

The EORTC QLQ-C30 and NLR were used as outcome measures in this study. Both of these measures have been proven to be valid and reliable assessments in cancer patients.[30, 31]

The NLR is an indicator of systemic inflammatory response, and has prognostic value for survival in patients with NSCLC. A higher NLR is associated with more aggressive cancer with a poor prognosis.

The EORTC QLQ-C30 is a 30-item questionnaire used to assess health-related QoL, and includes five function scales (physical, role, emotional, cognitive, and social) and eight single-item symptom scales (fatigue, nausea and vomiting, pain, dyspnea, sleep difficulty, appetite loss, constipation, and diarrhea). All function and symptom scales are 4-point scales (e.g. a