Acupoint Application in Nursing Care of Patients with Peripheral Lower Extremity Deep Vein Thrombosis: Postprint

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Date: 2022-10-21T00:00:00+00:00

Abstract

Objective To investigate the effect of acupoint plaster therapy in improving clinical symptoms and signs in patients with peripheral lower extremity deep vein thrombosis. Methods Sixty patients with peripheral lower extremity deep vein thrombosis were randomly divided into a control group and a study group, with 30 cases in each group. The control group received conventional treatment and nursing care, while the study group received acupoint plaster intervention in addition to conventional treatment. Changes in symptoms and signs of the affected limb were observed. Results After treatment, the degree of limb pain in the study group was significantly lower than that in the control group ($P<0.05$); the degree of edema in the affected limb in the study group was significantly lower than that in the control group ($P<0.05$); there was no statistically significant difference in the improvement of calf circumference of the affected limb between the two groups ($P>0.05$). Conclusion Acupoint plaster therapy can improve clinical symptoms and signs in patients with peripheral lower extremity deep vein thrombosis, and is clinically safe.

Full Text

Application of Acupoint Application in Nursing Care for Patients with Peripheral Deep Venous Thrombosis of the Lower Extremity

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Abstract

Objective: To investigate the effect of Traditional Chinese Medicine (TCM) acupoint application in relieving symptoms in patients with peripheral deep venous thrombosis of the lower extremity (LEDVT). **Methods:** A total of 60 patients with peripheral LEDVT were randomly divided into a control group and a study group, with 30 cases in each group. The control group received routine treatment and nursing care, while the study group received TCM acupoint application in addition to routine treatment and nursing. Changes in clinical symptoms and signs of the affected limb were observed. **Results:** After treatment, the study group showed significantly milder limb pain compared with the control group ($P<0.05$). The study group also demonstrated significantly less severe limb edema than the control group ($P<0.05$). However, there was no statistically significant difference in calf circumference improvement between the two groups ($P>0.05$). **Conclusion:** TCM acupoint application can improve clinical symptoms and signs in patients with peripheral LEDVT and is clinically safe.

Keywords: deep venous thrombosis of the lower extremity; venous thromboembolism; acupoint application; Traditional Chinese Medicine nursing

Introduction

Deep venous thrombosis (DVT) is a venous outflow obstruction disease caused by abnormal blood coagulation in deep veins, most commonly occurring in the lower extremities. When thrombi detach, they can cause pulmonary embolism (PE), and these two conditions are collectively termed venous thromboembolism (VTE) [1]. VTE has high morbidity and mortality rates. According to epidemiological studies, the incidence rate is 0.96-3.00 per 1,000 in the United States and 0.75-2.69 per 1,000 in Europe, posing a serious threat to human health. DVT often leads to PE and post-thrombotic syndrome (PTS), which can significantly affect quality of life and even cause death in severe cases [2]. Thrombosis in the calf muscle venous plexus and iliac-femoral veins, located peripherally, is referred to as the peripheral type [1]. When thrombi are located in the calf muscle venous plexus, Homans' sign and Neuhof' s sign are positive.

With the continuous development of modernization in Traditional Chinese Medicine, its therapeutic effects on thrombotic diseases have been increasingly confirmed [3]. In clinical practice, the application of Chinese herbal acupoint application for peripheral LEDVT has been found to reduce lower limb swelling and relieve limb pain. Herbal application has been widely used in the treatment and prevention of various diseases with certain therapeutic effects [4-5]. In recent years, the Fourth Department of Surgery at Dongfang Hospital of Beijing University of Chinese Medicine has applied Chinese herbal acupoint application as a nursing intervention for patients with peripheral LEDVT. This paper reports the application effects.

Methods

Participants Sixty patients hospitalized between January 2019 and June 2021 who were clinically diagnosed with peripheral LEDVT were selected. The patients ranged in age from 34 to 85 years, with a mean age of (62.38$±$5.08) years. All patients were treated conservatively with non-surgical methods after admission.

Diagnostic Criteria: The diagnostic criteria for peripheral DVT were established with reference to the "Chinese Guidelines for the Prevention and Treatment of Thrombotic Diseases" [6] and "Diagnostic and Therapeutic Criteria of TCM Syndromes" : pain and swelling in the gastrocnemius muscle with tenderness upon compression, increased pain during dorsiflexion of the foot, and edema in the ankle region. Possible histories included prolonged bed rest, prolonged sitting, trauma, puerperium, pelvic and abdominal surgery, tumors, or other vascular diseases. In the acute phase, total white blood cell count increased, and peripheral LEDVT was confirmed by venous flow graph, ultrasound Doppler, or venography.

Inclusion Criteria: (1) Met the diagnostic criteria for peripheral LEDVT; (2) Could cooperate with treatment and voluntarily participated in the study; (3) No skin damage in the lower limbs; (4) No allergy to Chinese herbs; (5) Complete clinical data.

Exclusion Criteria: (1) Central type LEDVT; (2) Pregnant or lactating women; (3) Patients with severe complications or serious primary or secondary diseases affecting survival who could not cooperate with treatment; (4) Skin ulceration in the lower limbs; (5) Allergy to Chinese herbs.

Patients were numbered "001-060" according to admission order and divided into groups: odd numbers were assigned to the study group and even numbers to the control group, with 30 cases in each group. The study group comprised 17 males and 13 females, aged 36-85 years with a mean age of $(65.72\$\pm1.40)years, and disease duration of 14-20 days with a mean of (13.80±1.40) days. Pain severity was graded 0–2 according to WHO pain classification, and 2. The control group comprised 14 males and 16 females, aged 35–85 years with a mean age of (65.01±3.48) years, and 20 days with a mean of (13.50±$1.70) days. Pain and edema severity were similarly graded. There were no statistically significant differences in general data including gender, age, disease course, and condition between the two groups (P>0.05), indicating comparability.

Interventions **Control Group:** Received conventional treatment and nursing care according to the routine diagnosis and treatment protocol for LEDVT, including anticoagulation therapy with low molecular weight heparin sodium injection (Hebei Changshan Biochemical Pharmaceutical Co., Ltd., National Drug Approval Number H20063910), combined with injectable Xueshuantong (Guangzhou Wuzhou Pharmaceutical (Group) Co., Ltd., National Drug Approval Number I20025652) or Danshen injection (Shanxi Pude Pharmaceutical

Co., Ltd., National Drug Approval Number H14023516) for comprehensive treatment for 14 days.

Study Group: In addition to the control group treatment, received Chinese herbal acupoint application at Chengshan (BL57) and Chengjin (BL56) points to activate blood circulation, resolve stasis, and promote diuresis to reduce swelling. The commonly used formula was Simiao Yong' an Decoction (Atractylodes 3 g, Coix seed 3 g, Phellodendron 8 g, Achyranthes 6 g, Astragalus 5 g, Aucklandia 6 g, Leech 8 g). Modifications were made according to clinical syndrome differentiation: for blood stasis predominance with obvious local pain, dark skin color, and significant tenderness, add 3 g each of Sanqi and Safflower; for damp-heat predominance with obvious local swelling, local pain, elevated skin temperature, and red skin color with possible early-stage fever, add 3 g of Forsythia and 5 g of Mirabilite. The above herbs were prepared according to the patient' s syndrome type, ground into coarse powder, mixed with honey into a paste, applied to the acupoints, and removed after 1-2 hours. The treatment duration was 14 days.

Outcome Measures **1. Pain Severity:** Evaluated according to WHO pain grading: Grade 0: no pain; Grade 1 (mild pain): continuous or intermittent dull pain, tolerable, normal life, sleep undisturbed; Grade 2 (moderate pain): obvious pain, intolerable, requiring analgesics, sleep disturbed; Grade 3 (severe pain): severe pain, intolerable, requiring analgesics, sleep severely disturbed, possibly accompanied by autonomic nervous dysfunction. Observation time was 9:00-10:00 AM daily.

2. Edema Severity: Evaluated according to WHO edema grading: Grade 0: no edema; Grade 1: slight indentation upon pressure that recovers quickly; Grade 2: obvious indentation that disappears within 10-15 seconds; Grade 3: deep indentation lasting at least 1 minute, with swollen distal lower limb; Grade 4: very obvious indentation still visible after 2-5 minutes, with very irregular distal lower limb. Observation time was 9:00-10:00 AM daily.

3. Calf Circumference: Measured at a fixed location 15 cm below the patellar lower margin [4]. Measurements were taken at enrollment, day 3, day 7, day 10, and day 14. Observation time was 9:00-10:00 AM daily.

Statistical Analysis SPSS 26.0 statistical software was used. Measurement data were expressed as mean ± standard deviation (x ± s) and compared between groups using t-tests. Count data were expressed as frequency and composition ratio and compared using ^{2} tests and non-parametric tests. The test level was α=0.05, with P<0.05 considered statistically significant.

Results

Pain Severity Comparison Before treatment, there was no statistically significant difference in pain grades between the two groups (P>0.05). After treat-

ment, both groups showed improvement in pain severity, with a statistically significant difference (P<0.05). Intergroup comparison showed that pain severity was significantly milder in the study group than in the control group (P<0.05). See Table 1 .

Edema Severity Comparison Before treatment, there was no statistically significant difference in edema severity between the two groups (P>0.05). After treatment, both groups showed improvement in edema severity, with a statistically significant difference (P<0.05). Intergroup comparison showed that edema severity was significantly milder in the study group than in the control group (P<0.05). See Table 2 .

Calf Circumference Comparison Before treatment, there was no statistically significant difference in calf circumference between the two groups (P>0.05). After treatment, both groups showed improvement in calf circumference, but there was no statistically significant difference between the groups (P>0.05). See Table 3 .

Discussion

Acupoint application is an important component of TCM therapeutics and a unique, effective treatment method summarized by Chinese laborers through long-term struggles against diseases. The *Lingshu · Jingmai* records: "The tendon of Foot-Yangming···when the chin tendon has cold, it urgently pulls the cheek and moves the mouth; when there is heat, the tendon relaxes and cannot be controlled, causing deviation. Treat with horse ointment, applying ointment to the tense areas, mixing white wine with cinnamon to apply to the relaxed areas···" , which has been praised by later generations as the treatment with plasters. Acupoint application therapy involves applying a paste prepared from Chinese herbs mixed with various liquids to specific acupoints, which not only allows drug absorption at specific sites but also stimulates acupoints and meridians. This therapy can exert dual effects of both herbs and acupoints, multiplying therapeutic efficacy [5]. Herbal application has also shown significant efficacy for local pain [7]. Therefore, our department utilizes herbal application technology combined with TCM meridian theory, directly applying the Simiao Yong' an Decoction formula to body surface acupoints. Through stimulation of acupoints, it achieves meridian dredging, qi and blood circulation, and diuresis to reduce swelling. It can also stimulate acupoints to promote blood vessel patency, and with careful nursing, can achieve reduction of limb swelling and pain [8].

Deep venous thrombosis belongs to the category of "Guzhong" (leg swelling) in TCM. Guzhong is mainly caused by trauma, surgery, tumors, postpartum prolonged bed rest, and other factors leading to impaired qi and blood circulation in the limbs, qi stagnation and blood stasis, blood stasis blocking the collaterals, and obstructed collaterals. This stagnation transforms into heat,

blocks nutrient blood reflux, causes fluid overflow, and results in limb pain and swelling [4]. In terms of herb selection, blood-activating, stasis-resolving, and qi-tonifying herbs can promote blood circulation and collaterals and prevent DVT formation [9]. In terms of administration, topical blood-activating drugs are also effective for LEDVT [10]. In our treatment, we select the Simiao Yong' an Decoction formula with modifications according to disease syndrome differentiation. For blood stasis predominance with obvious local pain, dark skin color, and significant tenderness, we add 3 g each of Sanqi and Safflower to activate blood circulation, resolve stasis, reduce swelling, and relieve pain. For damp-heat predominance with obvious local swelling, local pain, elevated skin temperature, and red skin color with possible early-stage fever, we add 3 g of Forsythia and 5 g of Mirabilite to clear heat, resolve dampness, and promote diuresis to reduce swelling. For acupoint selection, we use the proximal point selection method, choosing Chengshan (BL57) and Chengjin (BL56), both points of the Foot-Taiyang Bladder Meridian. Using these two points together can activate blood circulation, promote qi movement, resolve dampness, and reduce swelling [8]. Chengshan point has the effects of activating blood circulation, promoting qi movement, dredging meridians, and improving circulation. Research has confirmed that Chengshan point injection and acupuncture can rapidly and effectively relieve patient pain, with convenient and simple operation [11]. Chengjin point facilitates qi and blood circulation to nourish viscera and tissues. Studies have found that stimulating Chengjin point can promote lower extremity venous return by stimulating gastrocnemius muscle contraction [12].

TCM nursing operations have certain efficacy in the prevention and treatment of DVT formation [13]. Applying herbal application to treat LEDVT is simple, unaffected by external factors, and convenient to use. Clinical practice shows that the application of TCM acupoint application can not only increase treatment methods but also enrich healthcare professionals' experience in TCM characteristic nursing techniques. The application site is the affected calf, far from important functional areas of the body, with low application risk, safety controllability, and good patient compliance. After the treatment course, safety evaluation of the study group patients showed that 3 patients experienced local skin discomfort after application, but no special treatment was required; no adverse drug reactions were observed.

It is noteworthy that before applying herbal application, nursing staff should explain the procedure to patients, informing them and their families about the purpose, method, and effects of the herbal application to prepare them mentally. Accurate point selection is essential, and operators must be proficient in the surface location of acupoints using the proportional measurement method. Calf circumference should be measured with the patient in supine position, marking 15 cm below the patellar lower margin and maintaining records. Edema severity should be observed, assessed, and recorded daily at a fixed time (9:00-10:00 AM) with the patient in supine position to avoid errors caused by morning-light-evening-heavy edema. During the procedure, observe patient reactions

and skin conditions at the application site, protect the skin, prohibit scratching, and promptly manage any skin rashes or peeling after treatment.

In summary, applying TCM acupoint application in the treatment and nursing care of patients with peripheral DVT can not only reduce pain severity and improve therapeutic efficacy but also reduce oral medication. This intervention shows obvious effects, is easily accepted by patients, and has high safety, making it worthy of clinical promotion.

References

[1] Vascular Surgery Group, Chinese Society of Surgery, Chinese Medical Association. Guidelines for the diagnosis and treatment of deep venous thrombosis (2nd edition) [J]. Chinese Journal of Surgery, 2012, 50(7): 611-614.

[2] Luo D, Wang P. Current status of anticoagulation for venous thromboembolism and research progress of new anticoagulants [J]. Modern Medicine & Health, 2017, 33(21): 3294-3296.

[3] Wu Q, Wang G, Li X, et al. Clinical observation on treatment of post-thrombotic syndrome of lower extremity deep venous thrombosis with integrated traditional Chinese and Western medicine [J]. Chinese Journal of Thrombosis and Hemostasis, 2019, 25(2): 218-220.

[4] Wang H. Chen Shuchang' s experience in treating Guzhong [J]. Shandong Journal of Traditional Chinese Medicine, 2008, 27(2): 130-132.

[5] Ren S, Zhang J. Clinical application and research progress of TCM acupoint application therapy [J]. Journal of Liaoning University of Traditional Chinese Medicine, 2016, 18(6).

[6] Expert Committee of "Chinese Guidelines for the Prevention and Treatment of Thrombotic Diseases" . Chinese guidelines for the prevention and treatment of thrombotic diseases [J]. National Medical Journal of China, 2018(36).

[7] Peng L, Shi G, Luo W. Application of TCM acupoint application combined with community comprehensive intervention in nursing care of patients with chronic pain [J]. China Practical Medical, 2017, 12(13): 148-149.

[8] Liu J, Wang D, Li Y, et al. Application of Chinese herbal iontophoresis in nursing care of patients with peripheral LEDVT in subacute phase [J]. Beijing Journal of Traditional Chinese Medicine, 2016, 35(10): 922-924.

[9] Wang B, Wang P, Zhang K, et al. A Chinese herbal composition for preventing lower extremity deep venous thrombosis after fracture surgery and its preparation method: CN111195292A [P]. 2020-05-26.

[10] Yu Y, Wang J, Zhang H. Research progress in TCM treatment of lower extremity deep venous thrombosis [J]. Journal of Liaoning University of Traditional Chinese Medicine, 2019, 21(2): 137-140.

[11] Wan Y, Xin L, Chen Y. Clinical observation on treating renal colic with acupoint injection at Zusanli (ST36) and Chengshan (BL57) [J]. Chinese Medicine Modern Distance Education of China, 2021, 19(19): 117-119.

[12] Meng G, Yang S, Yu J. Effect of pulsed electrical stimulation at Chengjin (BL56) and Diji (SP8) on hemodynamic indicators of lower extremity deep veins [J]. The Journal of Traditional Chinese Orthopedics and Traumatology, 2014(8): 54-55.

[13] Tang L. Inheriting, innovating, and developing to comprehensively improve TCM nursing capabilities—Introduction to Beijing TCM Nursing Capability Enhancement Project column [J]. Integrative Nursing, 2021, 7(3): 1-3.

Conflict of Interest Statement: The authors declare no conflict of interest in this article.

Note: Figure translations are in progress. See original paper for figures.