

Efficacy Observation of Integrated Chinese-Western Nursing Intervention for High-Risk Diabetic Foot Patients (Post-print)

Authors: wisdom, Jinjing Liu, Guo Jing, Wang Xiaodi, Tong Fenfei, Zheng Wen, E Haiyan, Tang Ling, Tang Ling

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

Abstract

Objective To observe the effects of integrated traditional Chinese and Western medicine nursing intervention on high-risk diabetic foot patients, and its influence on patients' quality of life and prognosis, so as to provide a basis for adopting better nursing strategies and formulating more reasonable nursing intervention plans for high-risk diabetic foot patients. **Methods** From 200 patients with type 2 diabetes admitted to the hospital from January 2021 to January 2022, 40 high-risk diabetic foot patients were screened and randomly divided into observation group and control group, with 20 cases in each. The control group received conventional nursing intervention, while the observation group received integrated traditional Chinese and Western medicine nursing intervention on the basis of conventional care. The intervention effects of the two groups were evaluated, as well as their impact on patients' quality of life and foot condition. **Results** The intervention effect in the observation group was superior to that in the control group, with statistically significant difference ($P < 0.05$). The improvement rate of the Generic Quality of Life Inventory-74 (GQOL-74) score in the observation group was 85.00% (17/20), higher than 65.00% (13/20) in the control group, but the difference was not statistically significant ($P > 0.05$). The incidence of foot infection and foot ulcer in the observation group was lower than that in the control group, with statistically significant difference ($P < 0.05$). No patients in the observation group underwent amputation, while 3 patients in the control group underwent amputation. **Conclusion** Integrated traditional Chinese and Western medicine nursing intervention can further improve the therapeutic effect in high-risk diabetic foot patients, improve their quality of life and prognosis, and its intervention effect is superior to conventional nursing intervention.

Full Text

Evaluation of Integrated Traditional Chinese and Western Medicine Nursing for High-Risk Patients with Diabetic Foot

ZHI Hui¹, LIU Jinjing¹, GUO Jing¹, WANG Xiaodi¹, TONG Fenfei¹, ZHENG Wen¹, E Haiyan², TANG Ling²

¹Department of Peripheral Angiology, Dongfang Hospital, Beijing University of Chinese Medicine, Beijing, 100078

²Department of Nursing, Dongfang Hospital, Beijing University of Chinese Medicine, Beijing, 100078

Abstract

Objective: To investigate the effects of integrated Traditional Chinese and Western medicine nursing on treatment outcomes, quality of life, and prognosis in high-risk diabetic foot patients, and to provide evidence for developing more rational nursing intervention programs.

Methods: From January 2021 to January 2022, 200 patients with type 2 diabetes mellitus were screened, and 40 high-risk diabetic foot patients were eligible and randomly divided into an observation group and a control group, with 20 cases in each group. The control group received routine care during treatment, while the observation group received integrated Traditional Chinese and Western medicine nursing intervention based on routine care. Treatment outcomes, patient quality of life, and disease prognosis were compared between the two groups.

Results: The overall effective rate in the observation group was higher than that in the control group ($P < 0.05$). According to the General Quality of Life Inventory-74 (GQOL-74) assessment, the improvement rate in the observation group was 85.00% (17/20), showing no significant difference compared with 65.00% (13/20) in the control group ($P > 0.05$). The incidences of foot infections and foot ulcers in the observation group were lower than those in the control group ($P < 0.05$). Three cases of amputation were reported in the control group, while no amputations occurred in the observation group.

Conclusion: Integrated Traditional Chinese and Western medicine nursing showed positive effects on treatment outcomes, patient quality of life, and disease prognosis, with superior results compared to routine nursing care.

Keywords: integrated traditional Chinese and Western medicine nursing; high-risk diabetic foot; diabetes mellitus; amputation; quality of life

Introduction

Diabetic foot is a foot lesion caused by peripheral neuropathy complications and peripheral vascular disease in diabetic patients, clinically manifested as lower limb infection and deep tissue necrosis from ulcer formation. It is a relatively serious chronic complication commonly seen in diabetic patients, especially elderly patients, with poor prognosis. Severe cases often lead to amputation, with diabetic foot amputation rates being 25 times higher than in non-diabetic patients, ranking first among non-traumatic causes of disability. Research shows that the incidence of diabetic foot in diabetic patients ranges from 12% to 25%, and in China, amputations due to diabetic foot account for 40% to 60% of non-traumatic amputations. Peripheral vascular disease and peripheral neuropathy are high-risk factors for diabetic foot, and once high-risk diabetic foot develops, the potential risk of amputation and death increases significantly, seriously affecting patients' quality of life and life safety.

Related studies have demonstrated that different nursing interventions can significantly impact the quality of life, treatment efficacy, and prognosis of high-risk diabetic foot patients, and can significantly reduce the incidence of amputation. This study aims to further clarify the impact of different nursing interventions on high-risk diabetic foot, provide reference basis for better nursing strategies and clinical nursing programs, and improve disease prognosis and quality of life for diabetic foot patients.

1. Materials and Methods

1.1 Patient Selection From January 2021 to January 2022, 200 patients with type 2 diabetes mellitus admitted to our hospital were screened for high-risk diabetic foot. The inclusion criteria were: (1) diabetic foot lesions diagnosed as Wagner grade III or above; (2) severe lower limb ischemia with ABI value <0.5 measured by color Doppler ultrasound; (3) high risk of foot ulcers with vibration perception threshold $>25V$; and (4) GQOL-74 score ≤ 60 points. Exclusion criteria included: patients with severe primary or secondary diseases affecting survival, those unable to cooperate with treatment, and those with existing lower limb ulceration.

A total of 40 high-risk diabetic foot patients were screened, including 22 males and 18 females, aged 42-73 years (mean 58.30 years). Disease duration ranged from 3-15 years (mean 12.70 ± 5.80 years). All patients met the WHO diagnostic criteria for type 2 diabetes mellitus, with average fasting blood glucose of 12.1-18.2 mmol/L and postprandial blood glucose of 13.8-30.1 mmol/L before treatment. Pathological manifestations included 21 cases of neuropathic foot disease, 17 cases of ischemic foot disease, and 2 cases of mixed type. According to the Wagner grading system, there were 22 cases of grade III, 11 cases of grade IV, and 7 cases of grade V.

The 40 patients were randomly divided into an observation group and a control group, with 20 cases in each group. There were no statistically significant differences between the two groups in terms of age, disease course, pathological classification, or Wagner grade ($P > 0.05$). Both groups received the same treatment protocol and were comparable. All patients signed informed consent forms.

1.2 Interventions Both groups received identical treatment protocols, including insulin subcutaneous injection for blood glucose control, with close monitoring of fasting and 2-hour postprandial blood glucose changes. Anti-infection treatment was administered to improve microcirculation, and complications were actively treated. The control group received routine care, including standard treatment guidance and health education during follow-up visits. The observation group received integrated Traditional Chinese and Western medicine nursing intervention based on routine care.

1.2.1 Establishment of Nursing Management Team A nursing management team was established, consisting of 4 chief nurses with over 10 years of experience in diabetic foot care serving as team leader and deputy leaders, 2 physicians, and 6 nurses, all with more than 5 years of clinical experience.

1.2.2 Training Domestic diabetic foot experts and senior nurses were invited to conduct training through internal and external experience exchanges for key nurses, with assessments conducted until qualification was achieved.

1.2.3 Nursing Measures A comprehensive integrated Traditional Chinese and Western medicine nursing intervention plan was developed based on graded diagnosis.

1.2.3.1 Traditional Chinese Medicine Dietary Regulation: Patients were instructed to implement strict dietary control with timed, quantified meals. Reasonable distribution of protein, fat, and carbohydrate ratios was assigned according to disease severity. Patients and their families were taught to calculate food calories, food pairing methods, and nutritional calculations, and were guided on effective prevention and management of hypoglycemia. The common TCM syndrome type for diabetic foot is qi and yin deficiency, with treatment principles focusing on supplementing qi, nourishing yin, and activating blood circulation to remove stasis, often using modified Fangji Huangqi Decoction. In daily dietary regulation, patients were guided to use Astragalus membranaceus soaked in water as tea or in soup to achieve the effect of supplementing qi and nourishing blood.

1.2.3.2 Exercise Therapy Nursing: Patients were guided to perform reasonable exercise to promote muscle uptake, utilization, and oxidation of carbohydrates, achieving the goal of lowering blood glucose and improving respiratory, circulatory, endocrine, and nervous system functions. Before exercise, routine

examinations were conducted including ECG, cardiac function, blood pressure, blood glucose, and liver and kidney function tests. To promote peripheral blood circulation in the feet, the Buerger exercise method was used, which effectively promotes lower limb blood circulation. The exercise method includes three movements: (1) supine position with both lower limbs elevated at 45° for 1-2 minutes until foot skin becomes pale for 30-60 seconds; (2) sitting position with both lower limbs hanging beside the bed for 2-5 minutes, performing foot adduction, abduction, knee flexion, or ankle joint activities; and (3) return to supine position with the affected limb resting flat for 1-3 minutes. The above movements were repeated 5 times, conducted 3-5 times daily.

1.2.3.3 Blood Glucose Control: The importance of blood glucose control was explained to patients and their families, who were taught to use glucometers for self-monitoring. Insulin was injected at fixed times and quantities, with dosage adjusted according to blood glucose changes. Target blood glucose control was fasting blood glucose <8 mmol/L and postprandial blood glucose <10 mmol/L.

1.2.3.4 Foot Care: Foot skin color, temperature, and presence of redness or swelling were observed. Dorsalis pedis pulse and elasticity were checked, and the presence of blisters or deformities was examined. The toe squeeze method was used to check for flexion or hyperextension of proximal toe joints. For patients with foot ulcers, infection lesions were closely monitored. When deep tissue purulent secretions were abundant, doctors were promptly informed to perform debridement to remove purulent and necrotic tissue in stages to maintain incision and wound drainage. If lesions enlarged with systemic toxic symptoms, pus culture and drug sensitivity tests were performed, and systemic anti-infection treatment was administered. If infection could not be controlled long-term, amputation was considered.

1.2.3.5 Emotional Nursing: Diabetic foot patients have multiple negative psychological influences. Diabetes is a lifelong disease, and when foot ulcers emit foul odors, patients are prone to inferiority complexes. High-risk diabetic foot patients facing amputation risk often develop fear, compounded by economic, social, and cultural factors, and long-term suffering from chronic disease, resulting in significant psychological differences. Necessary psychological guidance should be provided for different patients to eliminate negative emotional factors such as anxiety and fear, actively communicate with patients and families, patiently explain disease progression, and encourage patient cooperation with treatment while maintaining a positive mood.

1.2.3.6 Health Education: Health education on diabetic foot knowledge was actively conducted, including causes, hazards, and prevention methods. Since high-risk diabetic foot patients already have foot lesions that damage peripheral vascular and nerve tissues, the harm is more severe. Patients' awareness of diabetic foot should be enhanced, strengthening their understanding of diabetes progression and factors affecting disease progression to improve their self-prevention capabilities.

1.3 Evaluation Criteria 1.3.1 Assessment Standards: High-risk diabetic foot diagnostic criteria: lower limb vascular disease was determined by color Doppler ultrasound, with ABI normal range of 1.0-1.3, <0.9 indicating mild ischemia, 0.7-0.5 moderate ischemia, and <0.5 severe ischemia. Lower limb neuropathy was assessed by vibration perception threshold testing, with normal range 0-10V, 10-15V indicating mild ulcer risk, 15-25V moderate risk, and >25V high risk. Diabetic foot grading diagnosis followed the Wagner grading system.

1.3.2 Efficacy Determination: Both groups were evaluated for intervention effects, quality of life improvement, foot condition, and amputation incidence after nursing intervention. Based on clinical symptom improvement: (1) cured—symptoms completely disappeared, ulcers healed, skin color returned to normal; (2) markedly effective—partial symptom disappearance, ulcer surface reduced by >2/3; (3) effective—partial symptom disappearance, ulcer surface reduced by 1/3-2/3; and (4) ineffective—no significant clinical symptom change, ulcer surface improvement <1/3, no skin color change. Quality of life improvement rate was measured by GQOL-74 score changes, including physical function, psychological function, life function, and social function. Evaluation criteria: significantly improved (GQOL-74 score increase \geq 10 points), improved (score increase <10 points), and decreased (score reduction).

1.4 Statistical Methods SPSS 20.0 software was used. Count data were expressed as percentages (%) and analyzed using the χ^2 test. Measurement data were expressed as mean \pm standard deviation and analyzed using t-tests. The test level was $\alpha=0.05$, with $P<0.05$ considered statistically significant.

2. Results

2.1 Comparison of Intervention Effects The intervention effect in the observation group was superior to that in the control group, with statistically significant difference ($P<0.05$).

2.2 Quality of Life Improvement The GQOL-74 score improvement rate in the observation group was 85.00% (17/20), higher than the control group's 65.00% (13/20), but the difference was not statistically significant ($P>0.05$).

2.3 Foot Condition Comparison The incidences of lower limb pain and convulsions, foot skin dryness and cracking, callus/blisters, foot infection, foot ulcers, and foot deformities in the observation group were all lower than in the control group. Among these, the differences in foot infection and foot ulcer incidence were statistically significant ($P<0.05$). No amputations occurred in the observation group, while 3 cases of amputation occurred in the control group.

3. Discussion

Diabetic foot is a foot lesion caused by diabetic peripheral vascular disease and peripheral neuropathy complications, which can lead to lower limb infection, deep tissue infection from ulcer formation, and necrosis, with severe cases resulting in amputation. Research reports [7-8] indicate that the disability rate from non-traumatic causes is 40 times higher in diabetic patients than in non-diabetic patients. Diabetic foot patients' peripheral vascular disease and peripheral neuropathy complications are high-risk factors for eventual amputation. Severe peripheral vascular disease and high-risk peripheral neuropathy further increase patients' potential risk of amputation [9]. Recent studies [10] also show that high-risk factors for diabetic foot are related to Wagner grading, with higher grades indicating greater risk. High-risk diabetic foot patients have severe vascular disease or high-risk peripheral neuropathy, or both, causing serious damage to diabetic patients' feet. Once lower limb infection and deep tissue necrosis from ulcer formation occur, they are difficult to heal, and patients face amputation risk. Diabetic foot seriously affects patients' quality of life and prognosis. In addition to active and effective treatment, the role of nursing intervention has received increasing attention. However, due to multiple factors such as advanced age, improper diet, and difficult-to-control infections caused by vascular/neuropathy lesions, conventional nursing cannot meet the requirements. Therefore, comparative studies on different nursing interventions for high-risk diabetic foot and the adoption of more reasonable nursing strategies are of great significance for diabetic foot patients.

Recent studies [11] have shown that nursing intervention can significantly impact diabetic foot patients' treatment efficacy, quality of life, and foot lesion recovery. Lei Yongting [12] observed significant improvement in foot function and quality of life through evidence-based nursing intervention. Zheng Wentao [13] used graded nursing intervention and observed statistically significant differences in fasting blood glucose and 2-hour postprandial blood glucose before and after intervention, concluding that graded nursing intervention significantly impacts blood glucose regulation. Li Jingli [14] used individualized comprehensive nursing intervention to observe complications and quality of life in early diabetic foot patients, finding statistically significant differences between intervention and control groups in treatment complications and quality of life. Additionally, Traditional Chinese Medicine nursing intervention has positive significance for improving diabetic foot clinical symptoms and prognosis [15].

The results of this study show that the intervention effect in the observation group was superior to the control group ($P < 0.05$). The GQOL-74 score improvement rate in the observation group was 85.00% (17/20), higher than the control group's 65.00% (13/20), but the difference was not statistically significant ($P > 0.05$). The incidences of foot infection and foot ulcers in the observation group were lower than in the control group ($P < 0.05$). These findings suggest that integrated Traditional Chinese and Western medicine nursing intervention can effectively improve treatment efficacy, enhance patient quality

of life, improve foot condition, and improve prognosis, consistent with the results reported by Du Jing [16]. Factors such as improper diet, poor blood glucose control ability, lack of exercise, and insufficient foot lesion control may be risk factors for disease progression and quality of life decline. Under conventional nursing models, medical staff lack awareness of certain risk factors and effective risk assessment, failing to meet nursing demands. The comprehensive integrated Traditional Chinese and Western medicine nursing intervention can comprehensively consider these multiple factors to develop more active individualized intervention plans [17]. Taking psychological intervention for diabetic foot patients as an example, since diabetes is a lifelong disease, foot lesions often cause foot ulcers and foul odors, leading to inferiority complexes. High-risk diabetic foot patients facing amputation risk often develop anxiety, fear, and other negative emotions. Influenced by social, cultural, and economic factors, negative emotions vary significantly among individuals. By implementing a comprehensive integrated Traditional Chinese and Western medicine nursing intervention, medical staff can develop individualized psychological nursing intervention plans based on different individual differences and implement targeted psychological intervention measures, thereby improving patient treatment compliance and encouraging patients to face their condition and cooperate with treatment.

High-risk diabetic foot patients have high risks of peripheral vascular disease and peripheral neuropathy, leading to lower limb infection, deep tissue infection, and gangrene, increasing amputation risk and being extremely unfavorable for prognosis. The key to achieving good prognosis lies in controlling infection. Close observation of foot condition progression and active anti-infection treatment are crucial for improving prognosis. The comprehensive integrated Traditional Chinese and Western medicine nursing intervention can enhance medical staff's attention to risk factors and develop intervention measures based on disease progression and individual differences. Compared with conventional nursing, this approach is more reasonable and can effectively improve treatment efficacy, enhance patient quality of life, and improve prognosis, making it worthy of clinical promotion.

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

References

- [1] Sun Ziran, Zhe Qi, Han Hongmei. Meta-analysis of the efficacy of integrated Traditional Chinese and Western medicine nursing for diabetic foot in China [J]. Evidence-Based Nursing, 2021, 7(8): 1021-1025.
- [2] Yang Liping, Zhou Min, Zeng Xiaoxue, et al. Effects of Traditional Chinese Medicine meridian foot exercises combined with behavioral nursing on nerve and vascular lesions in grade 0 diabetic foot patients [J]. Practical Clinical Medicine, 2021, 22(5): 64-66, 86.

- [3] Luo Qing. Study on the effect of integrated Traditional Chinese and Western medicine nursing intervention on diabetic foot outcomes and promotion of diabetic foot ulcer wound healing [J]. *Chinese Community Physicians*, 2021, 37(18): 163-164.
- [4] Luo Jianhong. Community nursing intervention for diabetic foot patients [J]. *Jilin Medical Journal*, 2016, 37(4): 969-971.
- [5] Guo Baofeng, Zhao Wei, Wu Hongfei, et al. Ilizarov metatarsal lengthening for diabetic foot ulcers with chronic osteomyelitis of metatarsal heads [J]. *Chinese Journal of Reparative and Reconstructive Surgery*, 2020, 34(8): 1000-1004.
- [6] Liu Boyu, Shen Ke, Zhai Kaihua, et al. Observation on the efficacy of negative pressure closed drainage combined with local oxygen therapy for chronic diabetic foot wounds [J]. *Journal of Xinxiang Medical University*, 2017, 34(5): 394-397.
- [7] Nie Min, Lu Yao, Li Chunyu. Effect of collaborative care model combined with individualized nursing on quality of life in diabetic foot patients [J]. *Chongqing Medicine*, 2017, 46(19): 2730-2732, 2736.
- [8] Bi Yiming, Lin Yuping, Fan Guanjie, et al. Research progress of regenerative medicine in diabetic lower extremity arterial disease [J]. *Journal of Medical Research*, 2020, 49(9): 177-180.
- [9] Zhang YQ, Van Netten JJ, Baba M, et al. Diabetes-related foot disease in Australia: a systematic review of the prevalence and incidence of risk factors, disease and amputation in Australian populations [J]. *J Foot Ankle Res*, 2021, 14(1): 8.
- [10] Rubio JA, Jimenez S, Lazaro-Martinez JL. Mortality in Patients with Diabetic Foot Ulcers: Causes, Risk Factors, and Their Association with Evolution and Severity of Ulcer [J]. *J Clin Med*, 2020, 9(9): 3009.
- [11] Wang Jiaojiao, Fang Sha. Application effect of comprehensive Traditional Chinese Medicine nursing in diabetic foot patients [J]. *Journal of Clinical Medical Research and Practice*, 2021, 6(14): 169-171.
- [12] Lei Yongting. Observation on the application effect of evidence-based nursing in diabetic foot patient care [J]. *Chinese Drugs and Clinics*, 2021, 21(4): 382-384.
- [13] Zheng Wentao. Effect of graded nursing intervention on blood glucose control, wound healing, and foot health behavior in diabetic foot patients [J]. *Clinical Medical Engineering*, 2019, 26(2): 253-254.
- [14] Li Jingli. Effect of collaborative nursing model combined with individualized nursing on complications and quality of life in diabetic foot patients [J]. *Drug Evaluation*, 2020, 17(9): 4-6.
- [15] Wang Liying, Gao Tianshu. Treatment of early diabetic foot disease with qi-supplementing and blood-activating Traditional Chinese Medicine foot bath

combined with nursing intervention [J]. Journal of Changchun University of Traditional Chinese Medicine, 2016, 32(5): 1036-1038.

[16] Du Jing. Analysis of the effect of comprehensive nursing intervention on wound repair-related factors in diabetic foot ulcers [J]. Foot and Health Care, 2018, 27(13): 45-47.

[17] Tang Ling. Inheritance, innovation, and development to comprehensively improve Traditional Chinese Medicine nursing capabilities—Introduction to the Beijing Traditional Chinese Medicine Nursing Capability Enhancement Project column [J]. Integrated Traditional Chinese and Western Medicine Nursing, 2021, 7(3): 1-3.

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

Source: ChinaXiv –Machine translation. Verify with original.