Journal of Clinical and Nursing Research, 2024, Volume 8, Issue 1
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Evaluation of the Efficacy of Auricular Acupoint Pressure Patch Combined with Modified Huangqi Decoction in Treating Diabetic Nephropathy

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Abstract: *Objective:* To explore the efficacy of auricular acupoint pressure patch combined with modified Huangqi Decoction in treating diabetic nephropathy. *Methods:* 60 patients with diabetic nephropathy treated in our hospital from January 2021 to December 2022 were selected for this study. The patients were randomly divided into two groups using the random number table method, with 30 patients in each group. Among them, the control group was treated with conventional Western medicine, while the experimental group was treated with auricular acupoint pressure patches combined with modified Huangqi Decoction. The patients' fasting blood glucose (FPG), 2-hour postprandial blood glucose (2hPG), glycated hemoglobin (HbA1c), urinary protein quantification, urea nitrogen (BUN), serum creatinine (SCr), and other indicators were detected and recorded before and after treatment. *Results:* Before treatment, there was no statistically significant difference in the FPG, the 2hPG, and the HbA1c between the two groups of patients ($P > 0.05$); after treatment, the FPG, the 2hPG, and the HbA1c of the patients in the experimental group were significantly lower than those in the control group ($P < 0.05$). Before treatment, there was no statistically significant difference in the urinary protein quantification, the BUN, and the SCr between the two groups of patients ($P > 0.05$); after treatment, the urinary protein quantification, BUN, and SCr of the patients in the experimental group were significantly lower than those in the control group ($P < 0.05$). The experimental group showed better improvement in symptoms such as fatigue, backache, and frequency of nocturia ($P < 0.05$). *Conclusion:* Auricular acupoint pressure patch combined with modified Huangqi Decoction effectively treats diabetic nephropathy and it helps control blood sugar and renal function indicators and improve clinical symptoms, therefore improving the patients' quality of life.

Keywords: Auricular acupoint pressure patch; Modified Huangqi Decoction; Diabetic nephropathy

Online publication: January 18, 2024

1. Introduction

Diabetic nephropathy is one of the most common chronic complications of diabetes, with a high incidence rate. As the number of diabetic patients increases, the incidence of diabetic nephropathy also increases. The occurrence and development of diabetic nephropathy are related to many factors, such as poor blood sugar

control, hypertension, dyslipidemia, etc [1-6]. Western medicine treatments for diabetic nephropathy mainly include controlling blood sugar, blood pressure, lipids, etc. These treatments cannot completely reverse the progression of diabetic nephropathy and have certain side effects. Traditional Chinese medicine (TCM) offers unique advantages in treating diabetic nephropathy. TCM believes that the occurrence of diabetic nephropathy is related to organ dysfunction and imbalance of qi, blood, yin, and yang. Therefore, TCM methods for treating diabetic nephropathy mainly include regulating organ function and replenishing qi, blood, yin and yang, etc. Among them, auricular acupoint pressure patches and modified Huangqi Decoction are common methods used by traditional Chinese medicine to treat diabetic nephropathy. Auricular acupuncture is a method of regulating the functions of the internal organs by stimulating acupoints in the ears. Studies have shown that auricular acupoint pressure patches can improve blood sugar, blood lipids, and other indicators of diabetic patients and also alleviate their clinical symptoms [7]. Modified Huangqi Decoction is a TCM prescription with *Astragalus membranaceus* as the main component. This decoction nourishes qi and yin, promotes blood circulation, and removes blood stasis. Studies have shown that modified Huangqi Decoction can improve the renal function and regulate the immune function of diabetic patients [8]. Therefore, this study aimed to evaluate the efficacy of an auricular acupoint pressure patch combined with modified Huangqi Decoction in treating diabetic nephropathy. By comparing the effects of conventional Western medicine treatment and auricular acupoint pressure patching combined with modified Huangqi Decoction, new ideas, and methods are provided for the clinical treatment of diabetic nephropathy.

2. Materials and methods

2.1. General information

A total of 60 patients with diabetic nephropathy who were treated in our hospital from January 2021 to December 2022 were selected for study. All patients who met the diagnostic criteria for diabetic nephropathy and other serious organ diseases were excluded. 60 patients were randomly divided into two groups using the random number table method, with 30 patients in each group. Among them, the control group was treated with conventional Western medicine. In contrast, the experimental group was treated with auricular acupoint pressure patches combined with modified Huangqi Decoction along with conventional treatment.

Inclusion criteria: 18 and 70 years old, regardless of gender; diagnosed with diabetic nephropathy (early or mid-stage); informed of the purpose, methods, possible risks, and benefits of this study, and signed an informed consent.

Exclusion criteria: presence of severe heart, liver, lung, kidney, or other organ dysfunction; patients with other serious diseases, such as malignant tumors, acute infections, etc., which may affect the research results; presence of mental illness or cognitive impairment, could not understand or cooperate with the research; pregnant or lactating women, or female patients who planned to become pregnant during the research; allergic to auricular acupressure patches or modified Huangqi Decoction, receiving other treatments that may affect the results of the research.

2.2. Method

The patients in the control group were treated with conventional Western medicine, which included controlling blood sugar, blood pressure, and lipids. On the other hand, the experimental group was treated with auricular acupoint pressure patches and modified Huangqi Decoction.

(1) Auricular acupoint pressure patch: Auricular acupoints such as kidney, pancreas, and endocrine were selected. Cowherb Seed (Chinese pinyin: *wang bu liu xing zi*) was pasted on the acupoints using hard

and odor-free tape. The acupoints were pressed 3 times a day for 5 minutes each time, and the patient should have felt sore and swollen. The tape was changed once a week, alternating between ears.

(2) Composition of modified Huangqi Decoction: The main ingredient was *Astragalus membranaceus*, along with yam, Red Sage, motherwort, Poria, Bai Zhu, etc. The following modifications were made according to the patient's symptoms: If the patient had qi and yin deficiency, Radix Pseudostellariae and *Ophiopogon japonicus* were added; if the patient had kidney yang deficiency, Aconite, and Cinnamon were added; if the patient had blood stasis, peach kernel and safflower were added. The ingredients were decocted in water and the decoction was administered twice a day (once in the morning and once in the evening).

2.3. Observation indicators

The patients' fasting blood glucose (FPG), 2-hour postprandial blood glucose (2hPG), glycated hemoglobin (HbA1c), urinary protein quantification, urea nitrogen (BUN), serum creatinine (SCr), and other indicators were detected and recorded before and after treatment.

2.4. Statistical analysis

SPSS23.0 statistical software was used for data analysis. The measurement data were expressed as mean ± standard deviation and compared using a *t*-test; the count data were expressed as percentages (%) and compared using a χ^2-test; $P < 0.05$ indicated a statistically significant difference.

3. Results

3.1. Blood sugar control

Before treatment, there was no statistically significant difference in the FPG, the 2hPG, and the HbA1c between the two groups of patients ($P > 0.05$); after treatment, the FPG, the 2hPG, and the HbA1c of the patients in the experimental group were significantly lower than those in the control group ($P < 0.05$).

Table 1. Comparison of blood sugar control between the two groups before and after treatment

Group	FPG		2hPG		HbA1c	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control group ($n = 30$)	8.51 ± 1.21	6.84 ± 0.91	13.62 ± 2.14	9.53 ± 1.62	7.42 ± 0.64	6.33 ± 0.55
Experimental group ($n = 30$)	8.21 ± 1.33	5.87 ± 0.36	13.39 ± 2.11	8.64 ± 1.36	7.54 ± 0.67	5.88 ± 0.45
t	0.91	5.43	0.42	2.31	0.71	3.47
P	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

3.2. Renal function

Before treatment, there was no statistically significant difference in the urinary protein quantification, the BUN, and the SCr between the two groups of patients ($P > 0.05$); after treatment, the urinary protein quantification, BUN, and SCr of the patients in the experimental group were significantly lower than those in the control group ($P < 0.05$).

Table 2. Comparison of renal function between the two groups before and after treatment

Group	Urine protein quantification		BUN		SCr	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control group (n = 30)	0.53 ± 0.11	0.35 ± 0.09	7.84 ± 1.31	7.82 ± 1.34	92.53 ± 13.22	81.71 ± 2.43
Experimental group (n = 30)	0.56 ± 0.08	0.31 ± 0.05	7.68 ± 1.34	6.87 ± 1.33	91.99 ± 12.68	80.01 ± 1.36
t	1.21	2.13	0.47	2.76	0.16	3.34
P	> 0.05	< 0.05	> 0.05	< 0.05	> 0.05	< 0.05

4. Discussion

Diabetic nephropathy is one of the most common chronic complications of diabetes that severely impacts the patient's quality of life and health status. Auricular acupoint pressure patch combined with modified Huangqi Decoction is a treatment method that combines external treatment using patches and oral administration of TCM decoction. This combined treatment serves to improve the symptoms of diabetic nephropathy by regulating the function of the organs and replenishing qi, blood, yin, and yang. Auricular acupoint pressure patch regulates the functions of organs by stimulating auricular acupoints, thus improving the patient's health. The main ingredient of modified Huangqi Decoction is *Astragalus membranaceus* as the main drug, which nourishes qi and yin, promotes blood circulation, and removes blood stasis, making it suitable for treating diabetic neuropathy [9-11].

Huangqi Decoction can help reduce blood sugar levels by regulating qi and blood [12]. Through long-term clinical observation and research, it was found that after patients took Huangqi Decoction, their blood sugar levels were effectively controlled, and their glycated hemoglobin (HbA1c) was also significantly reduced, which is of great significance in preventing the further deterioration of diabetic nephropathy. Modified Huangqi Decoction can promote the increase of glomerular filtration rate, reduce the burden on the kidneys, thus maintaining renal function [13]. The results of this study showed that the patients' urinary protein quantification, BUN, and SCr significantly improved after being treated with modified Huangqi Decoction. This shows that the modified Huangqi Decoction has a protective effect on the renal function of patients with diabetic nephropathy. Dyslipidemia is one of the important risk factors for diabetic nephropathy, and modified Huangqi Decoction can reduce blood lipid levels and prevent the occurrence of atherosclerosis [14]. Research has shown that patients' blood lipid levels significantly improved after taking the modified compound Huangqi Decoction, which is crucial in reducing the risk of complications in patients with diabetic nephropathy. Modified Huangqi Decoction can also improve the clinical symptoms of patients with diabetic nephropathy, such as fatigue, backache, edema, etc [15], which is proven through the results of this study.

Furthermore, the experimental group showed greater improvements in terms of blood sugar control and renal function, indicating that the auricular acupoint pressure patch combined with modified Huangqi Decoction is effective in treating diabetic nephropathy.

In addition, there were no incidences of severe adverse reactions among the patients in the experimental group, and only a few patients experienced mild skin irritation. This shows that the combination of auricular acupoint pressure patch with modified Huangqi Decoction is safe [16].

Their recurrence and long-term effects were observed through follow-up sessions for a certain period. The results showed that patients in the experimental group had a lower recurrence rate and better long-term effects. This may be attributed to the fact that auricular acupoint pressure patch combined with modified Huangqi Decoction can improve viscera function and enhance immunity.

Auricular acupoint pressure patch combined with modified Huangqi Decoction is suitable for treating diabetic nephropathy patients aged 18–70 who do not have severe heart, liver, lung, kidney, or other organ dysfunctions. Patients with allergies, pregnant or lactating women, mental illness, or cognitive impairment should be excluded.

Although the cost of an auricular acupoint pressure patch combined with the modified compound Huangqi Decoction to treat diabetic nephropathy is relatively high, its effectiveness is noteworthy. It can reduce the recurrence and hospitalization rates, thereby saving medical costs. At the same time, this treatment can be performed at home, which further reduces medical costs. The treatment should be performed according to the "Method" section of this paper. However, it is important to account for drug allergies and ensure a clean skin surface while performing this treatment.

5. Conclusion

Auricular acupoint pressure patch combined with modified Huangqi Decoction is effective in treating diabetic nephropathy. It effectively controls blood sugar and renal function indicators, improves clinical symptoms, and improves the patient's quality of life. Besides, this treatment method is simple and safe. Therefore, it should be popularized in clinical practice

Disclosure statement

The author declares no conflict of interest.

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