

The Therapeutic Effect of Combining Acupoint Application with Nourishing Qi and Blood Soup in Treating Diabetic Retinopathy

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Abstract: Objective: To analyze the application effect of combining acupoint application with nourishing Qi and blood soup in the treatment of diabetic retinopathy (DR). Methods: A total of 74 DR patients admitted to our hospital from March 2023 to March 2024 were selected for the study. They were evenly divided into a control group of 37 cases receiving routine Western medical treatment and an observation group of 37 cases receiving combined traditional Chinese medicine treatment. The clinical efficacy of the two groups was compared. Results: The levels of IFN- γ in the observation group were significantly higher than those in the control group, while the levels of VEGF, FPG, 2hPG, high shear whole blood viscosity, low shear whole blood viscosity, and platelet aggregation rate were significantly lower than those in the control group ($P < 0.05$). Conclusion: Combined traditional Chinese and Western medicine treatment can effectively control blood sugar and vascular endothelial growth factor levels, improve blood flow parameters, and has promotional value.

Keywords: Acupoint Application; Nourishing Qi and Blood Soup; Diabetic Retinopathy; Hemorheology

DR belongs to the multiple complications of DM, epidemiologically suggesting a high incidence rate of 19.24%. DR has multiple pathogenic factors, including the course of DM, blood glucose levels, presence of neuropathy, and accompanying kidney disease, which can lead to fundus lesions such as fundus congestion, vascular tumors, etc., potentially leading to blindness. Prolonged high blood sugar levels and abnormal hemorheology affect the retina, hinder capillaries, reduce ischemia and hypoxia, produce numerous angiogenic factors, increase neovascularization, and weaken vision. On one hand, controlling blood sugar and, on the other hand, taking effective measures to alleviate DR can promote visual improvement and inhibit disease progression. Western medical methods are commonly used in treating DR, selecting appropriate medications to reduce blood viscosity and regulate local microcirculation. Combined with traditional Chinese medical methods, such as acupoint application and the use of nourishing Qi and blood soup, can promote blood circulation, resolve stasis, and regulate microcirculation in DR. This study aimed to analyze the application effect of combined traditional Chinese and Western medicine treatment in DR patients.

1. Materials and Methods

1.1 General Information

A study was conducted on 74 patients with DR from March 2023 to March 2024 in our hospital. They were evenly divided into a control group of 37 cases, including 19 males and 18 females, aged between 43 and 70 years with an average age of (56.64 \pm 5.39) years, and an observation group of 37 cases, including 20 males and 17 females, aged between 44 and 71 years with an average age of (57.76 \pm 5.18) years. There was no significant difference in general data between the two groups ($P > 0.05$), indicating comparability.

Inclusion criteria: Patients who met the diagnostic criteria for DR, had a history of diabetes, experienced decreased vision (both eyes), and provided informed consent for this study. **Exclusion criteria:** Patients with medication contraindications, fluctuating blood lipids or blood sugar levels, abnormal liver or kidney function, primary fundus lesions, or a history of eye trauma or surgery.

1.2 Methods

Both groups received basic hypoglycemic therapy. Metformin (produced by Hunan Erkangxiang Pharmaceutical; National Drug Ap-

proval No. H43020277) was administered orally at a dose of 1.5g per day. Dapagliflozin (produced by AstraZeneca Pharmaceutical; National Drug Approval No. J20170040) was selected at a dose of 10mg per day orally to ensure fasting plasma glucose (FPG) levels were maintained between 4.4-7.0mmol/L and HbA1c levels were below 7.0%. Blood sugar levels were monitored throughout the treatment to prevent large fluctuations and reduce the risk of hypoglycemia. Patients were advised on exercise and diet control to maintain physical and mental health.

The control group received conventional Western medical treatment: Calcium Dobesilate (produced by Beijing Jingfeng Pharmaceutical; National Drug Approval No. H20010795) was orally administered at a dose of 0.5g per dose, three times a day for 4 weeks. The observation group received combined traditional Chinese medicine treatment: (1).Acupoint Application: A mixture of 5g Salvia miltiorrhiza, 5g Achyranthes bidentata, 5g Cassia seed, and 5g Curcuma root was ground into powder. The powder was mixed with an appropriate amount of Vaseline, heated to obtain an ointment, cooled, and then evenly applied to medical adhesive patches. The patches, sized 1.5cm×1.5cm, were applied to specific acupoints including Taiyang (EX-HN5), Yangbai (GB14), and Jingming (BL1) for 0.5-1.0 hours once a day.(2).Nourishing Qi and Blood Soup: A decoction was prepared by boiling 10g Hirudo, 10g Ligusticum chuanxiong, 15g Polygonum multiflorum vine, 15g Angelica sinensis, 25g Salvia miltiorrhiza, 30g Achyranthes bidentata, 30g Codonopsis pilosula, and 50g Astragalus membranaceus with water. The decoction was divided into two portions, with each portion of 150ml taken warm orally once a day for 4 weeks.

1.3 Observation Items and Indicators

Evaluation of Blood Sugar Indicators: Fasting plasma glucose (FPG) and 2-hour postprandial glucose (2hPG) were measured using a blood glucose meter, model NB-IOT, from Aiolos.

Evaluation of Hemorheological Parameters: High shear whole blood viscosity, low shear whole blood viscosity, and platelet aggregation rate were measured using a fully automatic hemorheological analyzer, model HT-100G, from Zibo Hengtuo. Evaluation of Angiogenic Factors: Fasting venous blood samples of 3ml were collected and centrifuged at 3000r/min for 5 minutes to separate the supernatant. The levels of IFN- γ and VEGF were measured using ELISA.

1.4 Statistical Methods

SPSS 27.0 was used for data analysis. Data are presented as mean (\pm standard deviation). The t-test was used for comparison, with $P < 0.05$ indicating statistical significance.

2. Results

2.1 Comparison of Blood Sugar Indicators between Two Groups

Comparing FPG and 2hPG, both were lower in the observation group ($P < 0.05$). See Table 1.

Table 1 Comparison of Blood Sugar Indicators between Two Groups [n(\pm s)]

Group	Number	FPG (mmol/L)		2hPG (mmol/L)	
		Before Treatment	After Treatment	Before Treatment	After Treatment
Observation Group	37	9.23 \pm 1.34	5.62 \pm 0.87a	15.71 \pm 1.63	7.61 \pm 0.70a
Control Group	37	9.25 \pm 1.31	6.25 \pm 0.60a	15.82 \pm 1.57	8.62 \pm 0.67a
t	/	0.065	3.626	0.296	6.340
P	/	0.948	0.001	0.768	0.000

Note: Compared with before treatment in the same group, aP < 0.05

2.2 Comparison of Hemorheological Parameters between Two Groups

Comparing high shear whole blood viscosity, low shear whole blood viscosity, and platelet aggregation rate, all were lower in the observation group ($P < 0.05$). See Table 2.

Table 2 Comparison of Hemorheological Parameters between Two Groups[n(±s)]

Group	Number	High Shear Whole Blood Viscosity (mPa·s)		Low Shear Whole Blood Viscosity (mPa·s)		Platelet Aggregation Rate (%)	
		Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment
Observation Group	37	6.53±1.14	4.57±0.83a	11.13±1.77	8.76±1.32a	74.59±7.64	57.68±6.86a
Control Group	37	6.58±1.09	5.13±1.11a	11.24±1.67	9.44±1.50a	74.61±7.58	62.51±7.46a
t	/	0.193	2.458	0.275	2.070	0.011	2.899
P	/	0.848	0.016	0.784	0.042	0.991	0.005

Note: Compared with before treatment in the same group, aP < 0.05

3. Discussion

Under the long-term influence of high blood sugar, patients may experience phenomena such as blockage and leakage of retinal microvessels, leading to fundus lesions and subsequently causing diabetic retinopathy (DR). This condition can result in decreased vision and interfere with daily life. For non-proliferative DR, the main treatment is usually drug therapy aimed at effectively controlling blood sugar, acting on the retina to increase capillary permeability, regulate microcirculation, and prevent DR from further progressing into the proliferative stage. The use of calcium dobesilate can exert its effects on capillaries, reducing permeability and increasing flexibility. This medication enhances the resistance of capillary walls, leading to a significant decrease in both plasma and blood viscosity. Numerous studies have shown the effectiveness of this drug in treating DR.

In clinical practice, traditional Chinese medicine (TCM) has significant advantages in treating DR. In TCM, DR is categorized under “Xiao Ke Nei Zang” and “Shi Zhan Hun Miao,” where deficiency of both qi and yin is considered as the root cause, and blood stasis is considered as the manifestation. Prolonged effects of Xiao Ke (diabetes) damage the patient’s essence and energy, leading to blood stasis obstruction, which originates from deficiency and results in DR. Analyzing the pathogenesis of DR, including blood stasis and deficiency of qi and yin, suggests treatment principles of promoting diuresis, eliminating dampness, invigorating qi, and promoting blood circulation. Based on Western medical methods, acupoint application is used, and herbs such as *Salvia miltiorrhiza*, *Achyranthes bidentata*, and *Curcuma* root are selected for application. These herbs promote blood circulation and resolve blood stasis. Acupoint application at Jingming (BL1) can effectively improve myopia and dizziness, while application at Yangbai (GB14) can alleviate eye redness and swelling, and application at Taiyang (EX-HN5) can relieve eye fatigue. These acupoints are all around the eyes and can effectively absorb the medication. Nourishing Qi and Blood Soup can improve symptoms of deficiency such as fatigue and palpitations. Huangqi plays a main role in this formula, strengthening the original qi. The combination of these herbs can strengthen the efficacy of tonifying qi, nourishing yin, and promoting blood circulation. Analyzing modern pharmacology, Huangqi contains proteins, polysaccharides, and amino acids, which can protect red blood cells, prevent deformation, strengthen the body’s immune system, and regulate microcirculation. Danshen can prevent platelet aggregation and regulate the body’s microcirculation. Hirudo can eliminate oxygen free radicals, resist thrombosis, and prevent blood clotting. Combining these two treatment methods can enhance the efficacy of DR treatment, regulate microcirculation, reduce blood viscosity, increase oxygen content in the eyes, alleviate macular edema, and improve vision.

This study’s results indicate that compared to the control group, the observation group exhibited significantly lower levels of FPG and 2hPG ($P < 0.05$), suggesting that combined traditional Chinese and Western medicine can enhance the control of blood sugar levels. Additionally, the observation group showed lower levels of high shear whole blood viscosity, low shear whole blood viscosity, and platelet aggregation rate ($P < 0.05$), indicating that combined treatment can improve blood rheology. In the early stages of DR, factors such as damaged endothelial cells and vascular basement membrane lead to a proliferation of IFN- γ , which obstructs cell differentiation and growth processes.

VEGF, a potent angiogenic factor, usually maintains dynamic equilibrium with related factors. However, in DR, the retina is affected, causing microvascular damage and hypoxia. This leads to a rapid increase in VEGF, triggering inflammation and neovascularization, further exacerbating DR. The observation group showed higher levels of IFN- γ and lower levels of VEGF ($P < 0.05$), indicating that combined treatment can regulate angiogenic factors.

In summary, combined traditional Chinese and Western medicine treatment for DR can effectively control blood sugar and angiogenic factors, improve blood flow parameters, and has significant implications for clinical practice.

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