

Clinical efficacy of invigorating qi, nourishing yin, and promoting blood circulation in treatment of type 2 diabetes mellitus.

Xiu-Feng Zhang*

Department of Pharmacy, People's Hospital of Rizhao, Rizhao, Shandong, China

Abstract

Objective: This study aims to investigate the clinical efficacy of invigorating qi, nourishing yin, and promoting blood circulation in the treatment of type 2 diabetes mellitus.

Methods: Sixty-six patients with type 2 diabetes mellitus admitted to our hospital from February 2015 to January 2017 were recruited in this study. Odd-even method was used to divide the patients into two groups. Patients in the control group (n=33) were given with conventional treatment for type 2 diabetes mellitus, and those in the observation group (n=33) were administered with a conventional scheme involving invigorating qi, nourishing yin, and promoting blood circulation. The TCM syndrome efficacy and the levels of TC, FBG, and FINS were compared between the two groups.

Results: Compared with the control group (72.73%), the observation group showed significantly improved TCM syndrome (96.97%) (P<0.05) and significantly increased levels of TC, FBG, and FINS (P<0.05).

Conclusion: Treating patients with type 2 diabetes mellitus by invigorating qi, nourishing yin, and promoting blood circulation can ensure TCM syndrome efficacy and increase the levels of TC, FBG, and FINS levels, thereby improving the treatment outcomes.

Keywords: Type 2 diabetes mellitus, Invigorating qi, Nourishing yin, Promoting blood circulation, Clinical efficacy.

Accepted on October 26, 2017

Introduction

The number of patients with type 2 diabetes mellitus continuously increases. The patients choose to undergo treatment with oral antidiabetic drug or insulin injection without obtaining the exact glycemic control effect [1]. Moreover, the patients may suffer from hypoglycemia, insulin resistance, weight gain, gastrointestinal adverse reactions, and liver and kidney damage [2]. Thus, developing a rational drug therapy is valuable to patients with type 2 diabetes mellitus [3]. This study aims to explore the value of invigorating qi, nourishing yin, and promoting blood circulation in ensuring clinical treatment efficacy and favorable prognosis for patients with type 2 diabetes mellitus.

Materials and Methods

General information

Sixty-six patients with type 2 diabetes mellitus admitted to our hospital from February 2015 to January 2017 were recruited to this study. Odd-even method was used to divide the patients into two groups. The control group (n=33) was composed of 10 males and 23 females aged 41-85 y (average: 54.62 ± 9.76 y) and weighing 42-85 kg (average: 57.43 ± 6.82 kg) and had the disease for 0.6-13.6 y (average: 6.36 ± 2.13 y). The observation group (n=33) comprised 11 males and 22 females

aged 43-89 y (average: 54.59 ± 9.79 y) and weighing 41-85 kg (average: 57.49 ± 6.89 kg) and had the disease for 0.8-13.9 y (average: 6.39 ± 2.12 y). No significant difference in sex, age, weight, and disease duration was noted between the two groups (P>0.05).

Inclusion and exclusion criteria

Inclusion criteria: Patients with type 2 diabetes mellitus included in this study were diagnosed on the basis of the following WHO-related diagnostic criteria: Fasting Blood Glucose (FBG) level as low as 7.0 mmol/L and postprandial blood glucose level as low as 11.1 mmol/L. All the patients were diagnosed with type 2 diabetes mellitus and classified under collateral obstruction by blood stasis on the basis of TCM syndrome. All the patients signed the informed consent.

Exclusion criteria: The following patients were excluded from the study: patients with infection, diabetic ketoacidosis, hyperthyroidism, and gestational diabetes; patients with liver, heart, brain, kidney, and other vital-organ complications or primary disease; women in lactation or pregnancy; patients undergoing long-term insulin treatment or current insulin treatment; patients who showed poor compliance or was unable to cooperate with the researchers; patients allergic to the experimental drug or belonged to allergic constitution; and patients who were unsuitable to participate in this study.

Method

Patients in the control group (n=33) underwent conventional treatment for type 2 diabetes mellitus, and those in the observation group (n=33) underwent a conventional scheme that involved invigorating qi, nourishing yin, and promoting blood circulation. Patients in the control group mainly underwent diet control, health education, and exercise therapy as fundamental intervention and were given with 1500 mg/d metformin. Patients in the observation group were treated by invigorating qi, nourishing yin, and promoting blood circulation. The traditional Chinese medicine administered to the patients at one dose per day consisted of 30 g of *Salvia miltiorrhiza*, *Astragalus*, and *Radix pseudostellariae*; 12 g of safflower, moutan bark, and yam; 20 g of dried rehmannia root; and 15 g of *Radix ophiopogonis*, *Schisandra chinensis*, *Rhubarb*, and *Polygonatum*. Water was added to the medicine until 500 ml, and the drug was decocted to 200 ml. The patients consumed the herbal decoction warm before meals, twice daily. Treatments for both groups were conducted for 4 months.

Standard criteria

The treatment outcomes of the patients with type 2 diabetes mellitus were determined on the basis of the standard criteria for TCM syndromes [4]. The scores were as follows: excellent, symptom score decreased to above 2/3; effective: symptom score decreased to 1/3-2/3; and invalid, symptom score decreased to no more than 1/3.

Statistical methods

Data from all the patients were analysed using the statistical software SPSS17.0. The count data (TCM syndrome evaluation results) were presented by (%) and compared between the groups by using χ^2 test. The measurement data

(FINS score) were presented by " $\bar{x} \pm S$ " and compared using t-test [5]. $P < 0.05$ indicated statistically significant difference.

Results

Comparison of TCM syndrome efficacies

Compared with the control group (72.73%), the observation group showed significantly improved treatment efficacy (96.97%, $P < 0.05$, Table 1).

Comparison of TC levels

Compared with the control group, the observation group showed significantly improved TC levels ($P < 0.05$, Table 2).

Comparison of FBG levels

Compared with the control group, the observation group revealed significantly improved FBG levels ($P < 0.05$, Table 3).

Comparison of FINS levels

Compared with the control group, the observation group demonstrated significantly improved FINS levels ($P < 0.05$, Table 4).

Table 1. Comparison of TCM syndrome efficacies between the two groups of patients with type 2 diabetes mellitus.

Group	n	Excellent	Effective	Invalid	Total effective rate (%)
Observation	33	25	7	1	96.97
Control	33	15	9	9	72.73
χ^2					7.5429
P					0.0060

Table 2. Comparison of TC levels between the two groups of patients with type 2 diabetes mellitus ($\bar{x} \pm S$).

Group	Time	n	TC (mmol/L)	TG (mmol/L)	PT (s)	FIB (g/L)	APT (s)
Observation	Before	33	8.11 \pm 0.99	4.70 \pm 0.47	10.95 \pm 0.49	4.31 \pm 0.26	27.97 \pm 3.55
	After	33	4.77 \pm 0.90	2.93 \pm 0.51	12.51 \pm 0.92	4.39 \pm 0.30	28.60 \pm 3.13
t			14.3405	14.6608	8.5973	1.1576	0.7647
P			<0.05	<0.05	<0.05	>0.05	>0.05
Control	Before	33	7.89 \pm 0.85	4.69 \pm 0.45	10.53 \pm 0.55	3.86 \pm 0.65	27.45 \pm 3.05
	After	33	5.69 \pm 0.93	4.65 \pm 0.45	11.76 \pm 1.01	4.23 \pm 0.73	32.70 \pm 3.15
t			10.0308	0.3610	6.1439	2.1745	6.8783
P			<0.05	>0.05	<0.05	>0.05	<0.05

Table 3. Comparison of FBG levels between the two groups of patients with type 2 diabetes mellitus.

Group	n	FBG (mmol/L)	2 h PG (mmol/L)	HbA1c (%)
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		Before	After	Before	After	Before	After
Observation	33	9.01 ± 0.81	6.62 ± 0.86	12.09 ± 1.15	7.95 ± 1.27	7.52 ± 0.87	6.09 ± 0.35
Control	33	8.73 ± 0.89	7.67 ± 0.87	11.81 ± 0.99	8.66 ± 1.01	7.35 ± 0.93	6.56 ± 0.29
t		1.3365	4.9306	1.0599	2.5135	0.7668	5.9400
P		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

Table 4. Comparison of FINS levels between the two groups of patients with type 2 diabetes mellitus.

Group	n	FINS (mIU/L)		ISI		BMI (kg/m ²)	
		Before	After	Before	After	Before	After
Observation	33	19.32 ± 0.98	15.01 ± 1.19	-5.55 ± 0.75	-5.39 ± 0.51	25.20 ± 1.45	24.05 ± 2.29
Control	33	19.16 ± 1.01	18.05 ± 1.42	-5.56 ± 0.60	-5.92 ± 0.63	25.55 ± 1.39	24.26 ± 1.91
t		0.6531	9.4259	0.0598	3.7562	1.0009	0.4045
P		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

Discussion

The rational application of invigorating qi, and nourishing yin, and promoting blood circulation can achieve significant results for patients with type 2 diabetes mellitus [6]. The component Astragalus can tonify the middle-Jiao and Qi and disperse the essence to the lung. Meanwhile, *Ophiopogon japonicus*, dried *Rehmannia* root, and *Salvia miltiorrhiza* help activate and nourish the blood and thus replenish and enhance yin [7]. *Schisandra chinensis* nourishes and astringes yin and engenders the liquid. Sealwort and *Radix pseudostellariae* can help nourish the qi to generate fluid and invigorate the spleen and lung [8]. Yam also aids in nourishing the kidney to strengthen yin and tonify splenic yin. *Carthamus tinctorius* helps promote blood circulation and remove blood stasis [9]. *Rhubarb* and Moutan bark can facilitate the clearing of heat, activation of blood, and dispersion of stasis. The compatibility of medicines can ensure the promotion of blood circulation and removal of blood stasis and help supplement qi and nourish yin in patients with type 2 diabetes mellitus [10].

Results revealed that the observation group showed significantly improved TCM syndromes (96.97%) (P<0.05) and significantly increased levels of TC, FBG, and FINS compared with the control group (72.73%) (P<0.05). These findings prove the value of invigorating qi, nourishing yin, and promoting blood circulation in treatment of patients with type 2 diabetes mellitus.

Conclusion

The rational application of invigorating qi, nourishing yin, and promoting blood circulation can improve the TCM efficacy and increase the levels of TC, FBG, and FINS for clinical treatment of patients with type 2 diabetes. The developed protocol can be used to successfully treat patients with type 2 diabetes mellitus.

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***Correspondence to**

Xiu-Feng Zhang

Department of Pharmacy

People's Hospital of Rizhao

China