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Effect of Yiqihuoxue Formula for the treatment of ischemic stroke

A retrospective study

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Abstract

This retrospective study assessed the feasible effect of Yiqihuoxue Formula (YQHXF) for the treatment of patients with ischemic stroke (IS).

A total of 66 patients with IS were included in this retrospective study. All patients received routine treatment, and were divided into two groups: a treatment group (n = 33) and a control group (n = 33). In addition to the routine treatment, all patients in the treatment group also underwent YQHXF treatment. All patients in both groups were treated for a total of 8 weeks. The outcomes were assessed by National Institute of Health Stroke Scale (NIHSS), modified Rankin scale (mRS), Barthel index scale (BIS), stroke-specific quality of life (SS-QOL) scale, and adverse events. All outcomes were measured before and after the treatment.

After treatment, patients in the treatment group showed better improvements in NIHSS scale ($P = .01$), mRS ($P < .01$), BIS ($P = .04$), and SS-QOL scale ($P = .04$), than patients in the control group. No treatment-associated adverse events were recorded in this study.

The results of this study indicated that YQHXF may benefit for patients with IS.

Abbreviations: BIS = Barthel index scale, IS = ischemic stroke, mRS = modified Rankin scale, NIHSS = National Institute of Health Stroke Scale, SS-QOL = stroke-specific quality of life, YQHXF = Yiqihuoxue Formula.

Keywords: effect, ischemic stroke, safety, yiqihuoxue formula

1. Introduction

Stroke is a very common neurological disease, and is also the leading cause of disability and mortality worldwide.[1–5] It is defined as the interruption of blood flow in a brain-supplying artery after having narrow or occlusion in blood vessels.[5,6] It is characterized by irreversible cell damage in the ischemic core, which causes motor and sensory deficits on the attacked body side.[5] It has been reported that ischemic stroke (IS) is the most common type stroke, and it accounts for about 85% of all stroke cases.[7,8] Up to date, its 5-year fatality rate is about 50%, and 40% of stroke survivors are disabled.[5] Thus, there is a strong demand for its treatment.

It is reported that alternative herbal medicine, such as Yiqihuoxue Formula (YQHXF) can preserve tissue in areas where perfusion is reduced.[9–13] It also helps restoring blood flow to avoid infarction, which can minimize the effects of ischemia.[14–19] However, insufficient data is available to support the evidence of YQHXF for the treatment of patients with IS. Thus, this retrospective study investigated the feasible effects of YQHXF for patients with IS.

2. Patients and methods

2.1. Ethical consideration

This retrospective study was approved by the ethics medical committee of The Second Affiliated Hospital of Xi'an Medical University. We collected all patient records at The Second Affiliated Hospital of Xi'an Medical University. In addition, all patients had provided the written informed consent.

2.2. Study design

This retrospective study included a total of 66 eligible patients with IS, who were admitted at the The Second Affiliated Hospital of Xi'an Medical University from January 2016 to December 2017. We divided those patients into a treatment group (n = 33),

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DR and TW contributed equally to this study.

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and a control group (n = 33). All patients were assigned to the treatment group and the control group according to the different treatments they received. All of them in both groups administered routine treatment. Additionally, patients in the treatment group also received YQHXF for a total of 8 weeks. All outcomes were measured before and after treatment. The data analyst was blind to the treatment schedule in this study.

2.3. Patients

Patients were included if they met the following criteria:

1. diagnosed as IS according to the Chinese Cerebrovascular Disease Prevention and Treatment Guideline[20];
2. age between 18 and 75 years;
3. time of insult from 5 weeks to 6 months after initial stroke onset;
4. presence of IS-induced neurological deficits, with National Institute of Health Stroke Scale (NIHSS) between 5 and 20; and
5. provided written informed consent.

We excluded patients if they were pregnant or lactation, intracerebral hemorrhage, difficulty to understand or to collaborate during the treatment, intracardiac thrombus, sepsis, cancers, severe heart, liver or kidney diseases, and cancer. In addition, we also excluded patients if they did not provide written informed consent and incomplete essential patient information. Furthermore, we also excluded patients if they undertook YQHXF 1 month prior to the study treatment.

2.4. Treatment schedule

All eligible stroke survivors in both groups administered routine treatment based on the Chinese Cerebrovascular Disease Prevention and Treatment Guideline.[20] In addition, patients in the treatment group received YQHXF (Astragalus 60 g, Angelica tail 15 g, Chuanxiong Rhizome 12 g, Red Peony Root 12 g, Geosaurus 20 g, Peach Kernel 6 g, Safflower 6 g, Salvia Miltiorrhiza 12 g, Heliotrope 12 g, Cinnamomum Cassia Presl 6 g), once daily at every morning and evening before meals. All patients in the treatment group administrated YQHXF for a total of 8 weeks.

2.5. Outcome measurements

Outcomes were measured by NIHSS scale,[21] modified Rankin scale (mRS),[22,23] Barthel index scale (BIS),[24] stroke-specific quality of life (SS-QOL) scale, and adverse events. NIHSS scale is used to objectively quantify neurological impairment in patients with stroke survivors, and it consists of 11 items, each of which scores from 0 to 4, with a total of 42.[21] The score of 0 means normal function, while that of 42 indicates worst function impairment.[21] MRS is commonly utilized for detecting degree of disability or dependence in daily activities of stroke survivors.[22,23] Its scale varies from 0 (perfect health) to 6 (death).[22,23] BIS is an ordinal scale and is widely utilized to assess the performance in activities of daily living.[24] It yields a score of 0 to 100, with higher score suggesting less independent.[24] SS-QOL scale is a patient-centered outcome measurement, and is designed to specifically evaluate health-related quality of life for stroke survivors.[25] It has 49 items encompassing 12 fields. Each item is graded on a 5-piont scale, with higher score notifying better quality of life.[25] All outcomes were detected before and after treatment.

2.6. Statistical analysis

This study employs SAS package (Version 7.0; SAS Institute Inc, Cary, NC) to analyze baseline and outcome data. All discontinuous data were analyzed using Mann–Whitney *U* test or *t* test, while all categorical data were analyzed using Pearson's chi-square test or Fisher's exact test. We defined a 2-side value of $P < .05$ as having statistical significance.

Although several associated studies report the combined therapy involved YQHXF for the treatment of IS, there is still insufficient evidence to specifically support the effects of YQHXF for patients with IS. Considering no study directly closes to the effects of YQHXF for IS, the minimum number of patients necessary to evaluate its effects with sample size of 33 patients in each group, and an expected dropout rate of 10%.[26]

3. Results

We summarized general characteristics of patients in both groups in Table 1. No statistical differences regarding all characteristics were detected between two groups in this study (Table 1).

After treatment, all outcomes in the treatment group showed better outcome measurements in NIHSS scale ($P = .01$, Table 2), mRS ($P < .01$, Table 3), BIS ($P = .04$, Table 4), and SS-QOL scale ($P = .04$, Table 5), than those in the control group. No adverse event was reported in patients of both groups in this study.

Table 1

Comparison of general characteristics between two groups.

Characteristics	Treatment group (n = 33)	Control group (n = 33)	*P*
Age (year)	63.2 (9.4)	64.5 (10.1)	.59
Gender			
Male	20 (60.6)	17 (51.5)	.46
Female	13 (39.4)	16 (48.5)	.46
Race (Chinese Han)	33 (100.0)	33 (100.0)	–
Educational background			
Primary school and below	8 (24.2)	6 (18.2)	.55
Secondary school	12 (36.4)	14 (42.4)	.61
High school	7 (21.2)	8 (24.2)	.77
College or university	6 (18.2)	5 (15.2)	.74
BMI (kg/m^2)	24.1 (2.5)	23.3 (2.8)	.22
Duration of post-stroke (month)	3.2 (1.0)	2.9 (1.3)	.29
Co-morbidities			
Cardiovascular diseases	11 (33.3)	8 (24.2)	.42
Respiratory diseases	5 (15.2)	7 (21.2)	.52
Osteoarthritis diseases	3 (9.1)	6 (18.2)	.29
Other	6 (18.2)	4 (12.1)	.49
NIHSS	11.1 (1.9)	11.4 (1.7)	.50
mRS	3.3 (0.9)	3.4 (1.1)	.69
BIS	61.3 (17.2)	59.8 (16.4)	.72
SS-QOL	96.7 (23.1)	99.5 (26.0)	.64

Data are present as mean ± standard deviation or number (%).

BIS = Barthel index scal; BMI = body mass index; mRS = modified Rankin scale; NIHSS = National Institute of Health Stroke Scale; SS-QOL = stroke-specific quality of life.

Table 2

Comparison of NIHSS after treatment between two groups.

Outcomes	Treatment group (n = 33)	Control group (n = 33)	P
Change from baseline	–6.4 (–8.5, –4.3)	–5.1 (–7.0, –3.3)	
Difference between two groups		–1.3 (–1.8, –0.9)	.01

Data are present as mean (range).
NIHSS = National Institute of Health Stroke Scale.

Table 3

Comparison of mRS after treatment between two groups.

mRS	Treatment group (n = 33)	Control group (n = 33)	P
Change from baseline	–1.2 (–1.6, –0.9)	–0.8 (–1.2, –0.5)	
Difference between two groups		–0.4 (–0.8, –0.1)	<.01

Data are present as mean (range).
mRS = modified Rankin scale.

Table 4

Comparison of BIS after treatment between two groups.

BIS	Treatment group (n = 33)	Control group (n = 33)	P
Change from baseline	14.4 (10.9, 18.0)	7.0 (4.1, 11.3)	
Difference between two groups		7.4 (3.8, 9.2)	.04

Data are present as mean (range).
BIS = Barthel index scale.

Table 5

Comparison of SS-QOL after treatment between two groups.

SS-QOL	Treatment group (n=33)	Control group (n=33)	P
Change from baseline	33.4 (27.8, 38.1)	17.1 (13.6, 22.0)	
Difference between two groups		16.3 (12.8, 19.7)	.04

Data are present as mean (range).
SS-QOL = stroke-specific quality of life.

4. Discussion

Studies suggested that YQHXF can be utilized to treat patients with IS. It is reported that YQHXF can not only preserve tissue in the ischemic area of blood supply,[9–13] but also can restore blood flow to decrease further infarction and ischemia in this area.[14–19]

To the best of our knowledge, insufficient data are available regarding the effects of YQHXF for IS. In this study, we specifically investigated the effects of YQHXF for the treatment of patients with IS. The results of this study showed promising outcomes of YQHXF for the treatment of patients with IS.

In the present study, its results exert beneficial improvements in outcomes of NIHSS scale, mRS, BIS, and SS-QOL scale. It suggests that YQHXF may be beneficial for patients with IS. In addition, this study did not identify any treatment related adverse events. Thus, YQHXF may be safe for such patients.

This study suffers from several limitations. First, it has an intrinsic limitation because it is a retrospective study. Second, this study only appraised the effects of YQHXF for IS after 2 months treatment and no further follow-up assessment was reported in the original case records. Third, lacking of randomization and blinding to patients and researchers may increase the selection risk. Finally, the sample size of this study is still small. Thus, further similar study should enlarge its sample size to warrant the findings of this study.

5. Conclusion

The results of this study showed that YQHXF may be efficacious for patients with IS.

Author contributions

Conceptualization: Dong-feng Ren, Ting Wang, Guo-fang Sun, Chao Jiang.
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