Research Article

Analysis of Clinical Efficacy of Traditional Chinese Medicine in Recovery Stage of Stroke: A Systematic Review and Meta-Analysis

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Background. We provide an updated meta-analysis with detailed information on a combination of TCM and routine treatment. Methods. Retrieve appropriate articles with no language restrictions on keywords until 8 July 2019 in an electronic database. All trajectories are screened according to certain criteria. The quality of certified research was also evaluated. We made a detailed record of the results of the measurement. Meta-analysis was carried out by using the Revman 5.3 software. Results. Sixty-seven RCTs were included, and 6594 subjects were analyzed. Compared with routine treatment, the total effective rate (TER) of TCM combined with routine treatment was improved, and the recovery of stroke was also significantly accelerated. Regulation of blood lipids by notably shrinking the contents of TC, TG, and LDL and enhancing the levels of HDL. The levels of serum hs-CRP, WHV, and WLV decreased significantly, indicating that the expression of thrombomodulin was decreased after the comprehensive treatment of traditional Chinese medicines (TCMs). The combination of TCM treatment could enhance the protection of neural function by decreasing the NIHSS scoring while increasing the BI scoring. Paeoniae Radix Rubra, Angeticae Sinensis Radix, etc., can effectively improve the clinical symptoms of stroke convalescent patients and promote the recovery of neurological function. ACU of Baihui, Renzhong, etc., can improve the clinical rehabilitation effect of patients. However, our findings must be handled with care because of the small sample size and low quality of clinic trials cited. Other rigorous and large-scale RCTs are in need to confirm these results. Conclusion. A combination of TCM and routine treatment in the treatment of stroke could improve TER, and it is beneficial to the rehabilitation of patients in the recovery period of apoplexy. These effects can be mediated by a combination of several mechanisms. Nevertheless, due to the limitations of this study, these results should be handled with caution.

1. Introduction

A stroke is an injury to a part of the brain that results in the death of brain cells which can be caused by a blockage of blood flow to a part of the brain (ischemic stroke) or by a tear of a blood vessel causing bleeding into the brain (hemorrhagic stroke) [1]. Stroke is highly prevalent and is one of the major contributors to morbidity and mortality worldwide [2]. The world is facing an epidemic of stroke [3]. Each year, stroke affects around 9 million people worldwide for the first time and results in long-term disability for around 6.5 million people [4]. Stroke is the leading cause of death in China and the second leading cause of death in the world [5]. In China, about 2.5 million people suffer from strokes each year, and 70% to 80% of patients lose the ability to carry out daily activities and routine care, resulting in a financial burden on the state and families [6]. Stroke is also the second leading cause of disability-adjusted life years globally [7].

Stroke not only impairs neurological function but also leads to severe medical complications [8]. Common deficits after stroke include weakness, numbness, vision problems, slurred speech and swallowing problems, difficulties with language, equilibrium and coordination problems, and problems with thinking [1]. They are terrifying ordeals that usually occur without warning—even though the causes are known—and rob people of their independence through
impacted speech and movement [9]. The damage caused by a devastating stroke to individual patients and families is incalculable; most elderly patients fear a disabling stroke more than they fear death [10]. Therefore, strengthening the treatment of the stroke recovery period is the key to reduce the mortality and disability rate. However, modern medicine lacks effective treatment for its recovery period, while traditional Chinese medicine (TCM) has great superiority [11]. TCM is frequently used throughout the world for stroke patients [12]. The purpose of TCM in the treatment of stroke is to reduce the symptoms of patients and eliminate the underlying causes. With a long history of thousands of years, TCM plays an important role in the treatment of complex diseases worldwide [13]. Besides China, TCM is popular not only in other parts of Asia but also in some western countries including in the USA and Australia [14]. TCM has attracted much attention because of its unique theoretical bases, which is quite different from that of Western medicine. TCM emphasizes the importance of using prescriptions, natural products, ACU, and physical exercise to improve the ability of individual endogenous healing through preventive, holistic, and healthy methods [15]. And the WHO has been avidly supporting traditional medicines, especially TCM, as a step towards its long-term goal of universal health care. According to the agency, in some countries, traditional treatments have the advantages of being cheaper and more accessible than western medicine [16]. TCM includes a wide range of practices, like herbal medicine and ACU, as well as other practices peculiar to most Westerners, such as cupping (heated cup therapy), tuina (massage), and moxibustion (burnt mugwort therapy) [17]. China’s considerable experience in the use of TCMs (traditional Chinese medicines) in stroke treatment shows that TCM preparations are effective, with few or no side effects. Other studies have pointed out that TCMs have many targets and a wide range of ways of action, which is in accordance with the pathophysiological process of stroke. In TCM, more than 100 kinds of TCMs have been used to prevent and treat stroke [18]. ACU has been used as a medical modality for over 3000 years in China. ACU is often used as an aid to mainstream rehabilitation after stroke, including the insertion of ACU needles into the skin of certain parts of the body [19]. The basic principle of ACU treatment is that intervention at specific acupoints on meridians and collaterals related to a specific organ system can restore the proper energy balance in the body, thus restoring the patient to health [20]. Other treatment of traditional Chinese medicine (OTTCM) includes moxibustion, needle knife, acupoint catgut embedding, cupping, and scraping. To sum up, TCM has the merits of diminishing disability rate, boosting quality of life, low toxicity and side effects, and low therapy cost for patients in poststroke recovery.

Despite numerous TCM interventions evaluated in previous randomized controlled trials (RCTs) to treat stroke, it is not comprehensive enough. Therefore, we have provided an updated and expanded meta-analysis, which provides detailed information for the combination of TCM and conventional treatment for stroke patients (Figure 1).

2. Methods and Program

2.1. Literature Retrieval Strategy. Keywords “stroke” or “Cerebral apoplexy” [Title/Abstract] AND “Clinical” [Title/Abstract] AND at least one of the following items including “Acupuncture” [Title/Abstract], “Traditional Chinese medicine” [Title/Abstract], “Moxibustion” [Title/Abstract], “Needleknife” [Title/Abstract], “Cupping” [Title/Abstract], “Scraping” [Title/Abstract], and “Traditional Chinese medicines” [Title/Abstract] were used as search items in electronic databases including PubMed, Wanfang, the China National Knowledge Infrastructure (CNKI), the VIP medicine information system (VMIS), Embase, the Cochrane Library, and the Chinese Biomedical Database (CBM), separately. All of the searches were performed from inception to July 2019. All relevant articles were downloaded into the EndNote software (version X9, Thomson Reuters, Inc., New York, NY, United States) for further exploration. A duplicate record was deleted. A full-text review was performed while the title/abstract was thought to be thematic. Three researchers independently assessed literature eligibility. Any disagreement was resolved by a consultation with a group discussion.

2.2. Inclusion and Exclusion Criteria. Based on the recommendations of the experts, we have designed the following inclusion criteria: (1) Patients in RCTs were diagnosed with stroke by the fourth National Conference on Cerebrovascular Diseases or criteria for diagnosis and evaluation of curative effect of apoplexy (CECEA), or Guidelines for the Diagnosis of Acute Ischemic Stroke in China (GDAISC), or diagnostic criteria for midbrain infarction in neurology (DCMIN) version 7, or Diagnostic Essentials of all kinds of Cerebrovascular Diseases (DECD) version 1995, or criteria for diagnosis and evaluation of therapeutic effect of apoplexy in traditional Chinese medicine (CDETAE), or Guidelines for the Prevention and Treatment of Cerebrovascular Diseases of the Chinese Society of traditional Chinese medicine (GPTCDCS) version 2010. (2) All trials mentioned were described as RCTs. (3) The experimental group treated with TCM treatment was based on the control group, while the control group was only given routine treatment. (4) The measurement of the results of each study must include at least one of the following indicators: high-sensitivity C-reactive protein (hs-CRP), total cholesterol (TC), triglyceride (TG), low-density lipoprotein (LDL), high-density lipoprotein (HDL), plasma viscosity (PV), whole low viscosity (WLV), hematocrit (HCT), whole high viscosity (WHV), homocysteine (HCY), fibrinogen (FIB), National Institutes of Health Stroke Scale (NIHSS), Fugl-Meyer Assessment (FMA), Barthel Index (BI), clinical spasticity index (CSI), modified Rankin scale (MRS), Syndrome Integral of Traditional Chinese Medicine (SITCM), standardized swallowing assessment (SSA), video-fluoroscopy swallowing study (VFSS), vascular endothelial growth factor (VEGF), evaluation result of activities of daily living (ADL), immunoglobulin A (IgA), immunoglobulin G (IgG), and immunoglobulin M (IgM).

If the study has one of the following items, it is not included: (1) Articles such as reviews, experiments, case reports, and missing data are considered to have nothing to
do with the subject. (2) The trial is not an RCT, or the diagnostic criteria in the statement are not clear. (3) Intervention for stroke patients is not based on TCM treatment.

2.3. Data Extraction and Quality Assessment. Information about qualified studies including authors, sample size, year of publication, type of intervention, and outcome measures was extracted and arranged in the tables. The quality of inclusion in the study was independently assessed by three researchers based on the Cochrane Intervention System Review Manual. Disagreement was settled by the consensus. The quality assessment is as follows: random sequence generation (selection bias), allocation concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome assessment (detection bias), incomplete outcome data (attrition bias), selective reporting (reporting bias), and other bias. Each semester is judged at three levels. The "low risk" of prejudice means that the description of the method or procedure is adequate. An inadequate or incorrect description of a method or procedure means "high risk," while the absence of a description of a method or procedure means "unclear risk." Two researchers used the GRADE system to grade the quality of evidence for all outcome indicators. Evaluation indicators include risk of bias, inconsistency, indirectness, imprecision, publication bias, large effect, plausible confounding, and dose-response gradient, a total of 8 factors, of which the first 5 are degrading factors and the latter 3 are escalating factors. The level of evidence is divided into four levels: high, moderate, low, and very low.

2.4. Data Analysis. Analyze the data by using Review Manager 5.3 (Cochrane Collaboration). Outcome measures such as TER were treated as dichotomous variables and emerged as the odds ratio (OR) with 95% confidence intervals (95% CI). Factors of blood lipid (TC, TG, LDL, and HDL), FMA scoring, NIHSS scoring, and so on were continuous variables that appeared the mean difference (MD) with 95% CI. We evaluated the heterogeneity between the studies by using Q statistics and $I^2$ tests. The data with low heterogeneity ($P \geq 0.1$ and $I^2 \leq 50\%$) were analyzed by using a fixed-effects model, while the data with high heterogeneity ($P < 0.1$ or $I^2 > 50\%$) were estimated by using the random-effects model. Funnel plots reveal potential publication bias. Egger’s test was further executed to examine the publication bias by meta for a package in R platform [21].

3. Results

After the database search, 10886 articles were identified, of which 1982 duplicate articles were deleted. Of the remaining 8904 articles, 4861 were excluded because of thematic disqualification. After the preliminary screening, there are still 4043 articles waiting for further full-text review. In the process, 3976 studies were excluded for the following reasons: (1) Diagnosis was vague. (2) There are mentioned unfit interventions. (3) There are single-arm designs. Finally, 67 studies [22–88] were included (Figure 2).

In this meta-analysis, 6544 patients with stroke were collected (3396 in the experimental group and 3198 in the control group). The patient’s age ranged from 18 to 85 years, and there was no significant difference in age and gender between the two groups. The age of the patients was between 18 and 85 years old, but there was no substantial difference in age and sex between the two groups (Table 1). All trials were conducted between 2004 and 2019, all of which were RCT, and combined TCM with routine treatment and routine treatment. Routine treatment is slightly different in qualified trials, and the usual method is to give some conventional anticoagulant, anti-infection, control blood pressure, control water and electrolyte disorders, and other drugs. Sixty-seven
patients disappeared, which was defined as a recovery.

The standard settings for TCMs, ACU, and OTTCM Treatment.

3.1.1. Outcome Measures with Subgroup Analysis: TER of TCMs Combined with Routine Treatment vs. Routine Treatment Alone. TC, TG, HDL, and LDL were the main indices that mentioned included studies. Statistical heterogeneity existed among single trials (P < 0.00001). There was no statistically significant heterogeneity among single trials (P = 0.59, I² = 0%). 18 studies [24, 29, 35, 38, 45, 48, 53, 56, 63, 66, 73, 76, 78] in the ACU group reported the TER. After a meta-analysis of these trials by using a fixed-effects model, the results depicted that ACU in combination with routine therapy vitally enhanced TER in stroke treatment (OR = 4.60, 95% CI: 3.41, 6.21, P < 0.00001). There was no statistically substantial heterogeneity between individual experiments (P = 0.97, I² = 0%). Six studies [27, 37, 52, 60, 67, 72] in the OTTCM group reported the TER. The results of a fixed-effects model analysis showed that the combination of OTTCMs and routine therapy could significantly improve TER (OR = 5.67, 95% CI: 3.24, 9.93, P < 0.00001). There was no statistically remarkable heterogeneity included in individual trials (P = 0.71, I² = 0%) (Figure 4).

3.1.2. Indices of Blood Lipid of TCMs Combined with Routine Treatment. The symptoms and signs of the patients were significantly improved. Effectiveness was defined that the symptoms and signs of the patients were improved. The symptoms and signs of the patients were not improved, or even aggravation was defined as invalidation. TER refers to the proportion of patients who were assessed to recovery, the obvious effect, and the effectiveness of total groups. TER was reported in 36 studies. In the TCM group, 12 trials [22, 34, 40–42, 47, 57, 60, 64, 67, 70, 81, 82, 87] mentioned the TER. The results of the meta-analysis of these tests by using a fixed-effects model showed that the combination of TCMs and routine treatment could crucially ameliorate the TER in the treatment of stroke (OR = 3.08, 95% CI: 2.27, 4.18, P < 0.00001). There was no statistically significant heterogeneity among single trials (P = 0.59, I² = 0%). 18 studies [24, 29, 35, 38, 45, 48, 53, 56, 63, 66, 73, 76, 78, 80, 88] in the ACU group reported the TER. After a meta-analysis of these trials by using a fixed-effects model, the results depicted that ACU in combination with routine therapy vitally enhanced TER in stroke treatment (OR = 4.60, 95% CI: 3.41, 6.21, P < 0.00001). There was no statistically substantial heterogeneity between individual experiments (P = 0.97, I² = 0%). Six studies [27, 37, 52, 60, 67, 72] in the OTTCM group reported the TER. The results of a fixed-effects model analysis showed that the combination of OTTCMs and routine therapy could significantly improve TER (OR = 5.67, 95% CI: 3.24, 9.93, P < 0.00001). There was no statistically remarkable heterogeneity included in individual trials (P = 0.71, I² = 0%) (Figure 4).

3.1.1. Outcome Measures with Subgroup Analysis: TER of TCMs, ACU, and OTTCM Treatment. The standard settings for TER are as follows: The symptoms and signs of the patients disappeared, which was defined as a recovery. Apparent effect was identified that the symptoms and signs of the patients were significantly improved. Effectiveness was defined that the symptoms and signs of the patients were improved. The symptoms and signs of the patients were not improved, or even aggravation was defined as invalidation. TER refers to the proportion of patients who were assessed to recovery, the obvious effect, and the effectiveness of total groups. TER was reported in 36 studies. In the TCM group, 12 trials [22, 34, 40–42, 47, 57, 60, 64, 67, 70, 81, 82, 87] mentioned the TER. The results of the meta-analysis of these tests by using a fixed-effects model showed that the combination of TCMs and routine treatment could crucially ameliorate the TER in the treatment of stroke (OR = 3.08, 95% CI: 2.27, 4.18, P < 0.00001). There was no statistically significant heterogeneity among single trials (P = 0.59, I² = 0%). 18 studies [24, 29, 35, 38, 45, 48, 53, 56, 63, 66, 73, 76, 78, 80, 88] in the ACU group reported the TER. After a meta-analysis of these trials by using a fixed-effects model, the results depicted that ACU in combination with routine therapy vitally enhanced TER in stroke treatment (OR = 4.60, 95% CI: 3.41, 6.21, P < 0.00001). There was no statistically substantial heterogeneity between individual experiments (P = 0.97, I² = 0%). Six studies [27, 37, 52, 60, 67, 72] in the OTTCM group reported the TER. The results of a fixed-effects model analysis showed that the combination of OTTCMs and routine therapy could significantly improve TER (OR = 5.67, 95% CI: 3.24, 9.93, P < 0.00001). There was no statistically remarkable heterogeneity included in individual trials (P = 0.71, I² = 0%) (Figure 4).
| Author, year | Cases T/C | Diagnostic standard | Age (years) range, mean | Sex male/female |
|--------------|-----------|---------------------|-------------------------|-----------------|
| Wang Yuxiu, 2017 | 41/41 | DCIS | T: 52-73, 59.8 C: 53-73, 59.9 | T: 28/13 C: 29/12 |
| Zhao Xiaoli, 2017 | 44/43 | NE | T: 43-59, 49.77 C: 42-58, 49.71 | T: 27/17 C: 27/17 |
| Chen Si, 2016 | 29/29 | MPDCD | T: 53-78, 61.15 C: 52-77, 62.18 | T: 20/9 C: 18/11 |
| Li Shefang, 2016 | 40/40 | CDECEA | T: 46-73, 65.9 C: 48-76, 66.3 | T: 23/17 C: 22/18 |
| Zhang Kefei, 2018 | 58/58 | MPDCD | T: 40-73, 58.93 C: 41-75, 59.37 | T: 35/23 C: 34/24 |
| Zhao Jing, 2016 | 75/75 | NR | T: 42-75, 60.6 C: 43-76, 58.8 | T: 51/24 C: 48/27 |
| Yang Zhenwei, 2017 | 33/32 | ATCICE | NR NR NR | NR C: 26/24 |
| Liu Yupeng, 2016 | 50/50 | CEDEA & GPTCDSTCM | T: 58-70, 61.19 C: 58-70, 61.19 | T: 27/23 C: 45/20 |
| Cao Ying, 2014 | 198/66 | ACILIWM & SDSQDBSS | T: 40-70, 63.1 C: 40-70, 63.3 | T: 111/87 C: 36/24 |
| Fu Yaping, 2018 | 60/60 | GDTAISC (2010) | T: 50-78, 62.1 C: 48-76, 60.2 | T: 38/22 C: 18/15 |
| Li Yaorong, 2015 | 33/33 | CDETEA | T: 34-78 C: 33-77 | T: 19/14 C: 36/29 |
| Wu Xiuhua, 2018 | 65/65 | MPDCD | T: 52-75, 62.3 C: 50-73, 61.2 | T: 34/31 C: 30/22 |
| Liu Weicheng, 2017 | 53/52 | NR | T: 35-80, 36.8 C: 36-78, 59.8 | T: 29/24 C: 30/22 |
| Chen Rong, 2011 | 40/40 | CDECEA & MPDCD | T: 55-82, 70.22 C: 52-78, 66.78 | T: 28/12 C: 30/10 |
| Li Naiqian, 2017 | 40/40 | GDTAISC (2010) & GPCRND | T: 46-75, 64.73 C: 48-78, 64.85 | T: 23/17 C: 22/18 |
| Zhong Lingyi, 2019 | 53/53 | GDAISC | T: 47-78, 59.56 C: 45-77, 60.25 | T: 30/23 C: 28/25 |
| Jia Liang, 2017 | 70/70 | MPDCD | T: 53-75, 64.90 C: 50-73, 64.72 | T: 45/25 C: 43/27 |
| Zhang Jin, 2004 | 76/60 | DCWM & DCTCM | T: 40-70, 57.25 C: 42-71, 58.13 | T: 49/27 C: 36/24 |
| Wang Chengtai, 2016 | 62/63 | GDTAISC (2010) & CDECEA | T: 37-80, 61.17 C: 34-81, 62.25 | T: 32/30 C: 32/31 |
| Niu Ben, 2016 | 48/48 | GDTAISC (2010) & DCQBSS | T: 61-73, 64.9 C: 60-72, 65.7 | T: 31/17 C: 33/15 |
| Wang Aili, 2019 | 47/47 | GDTAISC (2014) & CDECEA | T: 44-79, 57.02 C: 43-76, 56.87 | T: 25/22 C: 27/20 |
| Yuan Li, 2005 | 92/92 | DCTCM | T: 40-70, 58.37 C: 42-71, 58.23 | T: 54/38 C: 56/36 |
| Bian Yonghong, 2017 | 93/93 | GPCRND | T: 47-82, 63.1 C: 44-79, 63.8 | T: 51/42 C: 49/44 |
| Lou Fei, 2019 | 72/72 | GCDTDCD (2016) & CPTCM | T: 45-75, 61.26 C: 45-72, 60.85 | T: 44/28 C: 40/32 |
| Cai Jingjing, 2012 | 60/60 | CDECEA & RDCFNCCD | T: 35-75, 64.5 C: 38-73, 64.6 | T: 29/31 C: 31/29 |
| Chen Dan, 2018 | 30/30 | RDCFNCCD | T: 45-80, 64 C: 38-80, 65 | T: 19/11 C: 22/8 |
| Dai Shuqing, 2015 | 30/26 | MPDVKCD (1997) & SSDEA | T: 60-75, 67.1 C: 54-74, 64.9 | T: 19/11 C: 16/10 |
| Author, year | Cases T/C | Diagnostic standard | Age (years) range, mean | Sex male/female |
|-------------|-----------|---------------------|-------------------------|----------------|
| Deng Xiaodong, 2018 | 73/73 | GSPISTIAC (2014) & CDTEDSTCM | T: 45-75, 62.8 | C: 45-78, 63.7 | T: 40/33 | C: 39/34 |
| Du Xin, 2018 | 35/35 | NR | T: 41-65, 51.32 | C: 39-72, 50.67 | T: 18/17 | C: 16/19 |
| Feng Shengwang, 2016 | 30/30 | GDTAISC | T: 48-72, 60 | C: 46-71, 58 | T: 18/12 | C: 19/11 |
| Fu Qinhui, 2016 | 56/56 | CDECEA | T: 65.68 | C: 63.80 | T: 36/20 | C: 35/21 |
| Fu Xiaofeng, 2019 | 34/26 | RDCFNCCD & DCAFSATCM | T: 60.35 | C: 62.33 | T: 18/16 | C: 14/12 |
| Gao Ting, 2018 | 46/46 | GDTAISC | T: 63.76 | C: 64.23 | T: 25/21 | C: 27/19 |
| Huang Wei, 2018 | 98/98 | GDTAISC | NR | NR | NR | C: 39/19 |
| Jiang Ming, 2018 | 58/58 | RDCFNCCD | T: 58.47 | C: 57.02 | T: 38/20 | C: 30/15 |
| Lin Biyu, 2018 | 30/30 | CDECEA | T: 47-73, 65.32 | C: 46-71, 64.48 | T: 32/13 | C: 51/31 |
| Liu Sang, 2018 | 82/82 | MPDVKCD & SSDEA | T: 66.7 | C: 67.9 | T: 56/26 | C: 14/12 |
| Peng Shaokun, 2015 | 38/38 | SSDEA | T: 43-78, 61.6 | C: 41-81, 61.2 | T: 22/16 | C: 24/14 |
| Shi Youjia, 2018 | 66/66 | NR | NR | NR | NR | C: 24/16 |
| Shi Yunhua, 2017 | 40/40 | CDECEA | T: 51-78, 68.4 | C: 50-78, 68.6 | T: 25/15 | C: 24/16 |
| Song Yi, 2017 | 42/42 | SSDEA | T: 60.43 | C: 60.29 | T: 19/23 | C: 28/6 |
| Tang Youbin, 2014 | 34/34 | SSDEA | T: 31-64, 43 | C: 28-66, 38 | T: 23/11 | C: 31/19 |
| Wang Jing, 2019 | 35/35 | NR | NR | NR | NR | C: 21/19 |
| Xiao Yu, 2013 | 68/50 | NR | T: 40-71, 51.9 | C: 41-72, 52.1 | T: 41/27 | C: 25/17 |
| Xie Xiaojuan, 2018 | 43/40 | MPDVKCD | T: 56.94 | C: 58.15 | T: 22/21 | C: 33/17 |
| Xu Lei, 2017 | 30/30 | CDTEDSTCM | T: 40-74, 58 | C: 42-74, 61 | T: 15/15 | C: 24/16 |
| Xu Wansong, 2017 | 42/42 | MPDVKCD | T: 44-71, 56.18 | C: 45-73, 56.32 | T: 28/14 | C: 35/23 |
| Zhang Liao, 2018 | 50/50 | GPTCDC & CDECEA | T: 40-77, 55.9 | C: 41-76, 56.4 | T: 34/16 | C: 41/19 |
| Zhang Ningxia, 2010 | 40/40 | RDCFNCCD | T: 40-80, 65.9 | C: 40-80, 69.2 | T: 26/14 | C: 16/14 |
| Zhou Minya, 2018 | 58/58 | MPDVKCD | T: 59.45 | C: 58.16 | T: 39/19 | C: 17/13 |
| Zhou Shuxin, 2018 | 60/60 | RDCFNCCD | T: 49-84, 69.1 | C: 51-85, 70.4 | T: 38/22 | C: 31/18 |
| Yao Baonong, 2014 | 30/30 | CDECEA (1995) | T: 50-76, 60.9 | C: 52-77, 61.7 | T: 18/22 | C: 17/13 |
| Zhu Xiaolei, 2017 | 30/30 | GPTCDC (2007) | T: 51-76, 61.5 | C: 50-78, 62.3 | T: 16/14 | C: 31/18 |
| Yan Jiang, 2017 | 49/49 | NR | T: 55-75, 62.9 | C: 55-75, 63.1 | T: 32/17 | C: 17/22 |
between individual studies \( P < 0.00001, I^2 = 91\% \), so a random-effects model was applied to take a meta-analysis which demonstrated that the combination of TCMs and routine treatment significantly decreased the level of TC in blood lipid \( \text{MD} = -0.54, 95\% \text{ CI: } -0.80, -0.28, P < 0.0001, \) (Figure 5(a)). Seven trials [22, 23, 44, 57, 59, 64, 70] provided the contents of TG. There was statistically significant heterogeneity among individual studies \( P < 0.00001, I^2 = 89\% \), so a random-effects model was applied to take a meta-analysis which demonstrated that the combination of TCMs and routine treatment significantly decreased the level of TG in blood lipids \( \text{MD} = -0.48, 95\% \text{ CI: } -0.64, -0.31, P < 0.00001, \) (Figure 5(b)). Detection of LDL was reported in five trials [22, 23, 44, 59, 64]. Heterogeneity was found among individual studies \( P < 0.00001, I^2 = 94\% \), and then, a random-effects analysis was applied to demonstrate that TCMs and routine treatment significantly decreased the level of LDL in blood lipid \( \text{MD} = -0.81, 95\% \text{ CI: } -1.19, -0.42, P < 0.0001, \) (Figure 5(c)). Five studies [22, 23, 44, 59, 64] provided data of HDL. There was heterogeneity among individual trials \( P < 0.00001, I^2 = 93\% \) and a meta-analysis using a random-effects analysis proved that combination of TCMs and routine treatment significantly increased the level of HDL in blood lipid \( \text{MD} = 0.24, 95\% \text{ CI: } 0.09, 0.38, P = 0.001, \) (Figure 5(d)).

### Table 1: Continued.

| Author, year          | Cases T/C | Diagnostic standard                                                                 | Age (years) range, mean | Sex male/female |
|-----------------------|-----------|--------------------------------------------------------------------------------------|-------------------------|-----------------|
| Huo and Wang, 2014   | 36/32     | CDECEA (1996)                                                                        | T: 59                   | C: 62           |
|                       |           |                                                                                      | T: 20/16                | C: 18/14        |
| Guo Chenggang, 2015  | 36/36     | DCCCA (1995)                                                                          | T: 55.7                 | C: 56.2         |
|                       |           |                                                                                      | T: 20/16                | C: 19/17        |
| Ding Min, 2018       | 40/39     | CDECEA (1996) & MPDAKCD                                                              | T: 46-69, 61.0          | C: 44-70, 60.2  |
|                       |           |                                                                                      | T: 19/21                | C: 20/19        |
| Yan Hongda, 2018     | 45/45     | NR                                                                                    | T: 65.65                | C: 63.21        |
|                       |           |                                                                                      | T: 25/20                | C: 28/17        |
| Zhao Lijuan, 2013    | 40/40     | NR                                                                                    | T: 44-78, 62.72         | C: 48-80, 62.56 |
|                       |           |                                                                                      | T: 22/18                | C: 19/21        |
| Nie Bin, 2013        | 40/40     | CETEDA & MPDAKCD                                                                     | T: 38-75, 58            | C: 38-75, 59   |
|                       |           |                                                                                      | T: 23/17                | C: 21/19        |
| Hou and Liu, 2014    | 36/32     | CDECEA (1996)                                                                        | T: 59.2                 | C: 61.8         |
|                       |           |                                                                                      | T: 20/16                | C: 18/14        |
| Huo Xinhui, 2016     | 36/32     | MPDAKCD & CDECEA                                                                     | T: 52.25                | C: 54.88        |
|                       |           |                                                                                      | T: 25/11                | C: 19/13        |
| Yang Haixia, 2016    | 30/30     | ESCETCMDA (1995) & GDTALSC (2010)                                                    | T: 28-67                | C: 31-70        |
|                       |           |                                                                                      | T: 20/10                | C: 18/12        |
| Li Chaoming, 2018    | 43/43     | CDTEDSTCM & DCA                                                                      | T: 48-76, 62.4          | C: 46-77, 63.1  |
|                       |           |                                                                                      | T: 25/18                | C: 24/19        |
| Zhao Yang, 2017      | 39/39     | NR                                                                                    | T: 48-74, 62.04         | C: 47-73, 61.75 |
|                       |           |                                                                                      | T: 22/17                | C: 21/18        |
| Wang Ling, 2014      | 30/30     | SDTRMC                                                                                | T: 53.53                | C: 51.53        |
|                       |           |                                                                                      | T: 21/9                 | C: 18/12        |

ATCICE: atherosclerotic thrombotic cerebral infarction or cerebral embolism; ACU: acupuncture; ACILW: arteriosclerosis cerebral infarction or lacunar infarction in western medicine; C: control group; CDEEA: criteria for evaluation of diagnostic efficacy of apoplexy; CDECEA: criteria for diagnosis and evaluation of curative effect of apoplexy; CDTEDSTCM: criteria for diagnosis and therapeutic effect of diseases and syndromes of traditional Chinese medicine; CETEDA: criteria for evaluation of therapeutic effect in the diagnosis of apoplexy; CPTCM: clinical pathway of traditional Chinese medicine in 22 specialties and 95 diseases; DCETEA: criteria for diagnosis and evaluation of therapeutic effect of apoplexy in traditional Chinese medicine; DCFSATCM: diagnostic criteria for apoplexy formulated by the state administration of traditional Chinese medicine; DCA: diagnostic criteria for apoplexy; DCCA: diagnostic criteria of cerebral apoplexy; DCIS: diagnostic criteria of ischemic stroke; DCQBSS: diagnostic criteria of qi deficiency and blood stasis syndrome in traditional Chinese medicine; DCTCM: diagnostic criteria of traditional Chinese medicine; DCWM: diagnostic criteria of western medicine; ESCETCMDA: evaluation standard of curative effect of traditional Chinese medicine; CDECEA: evaluation standard of curative effect of traditional Chinese medicine diagnosis of apoplexy; GDTALSC: guidelines for secondary prevention of ischemic stroke and transient ischemic attack in China; GPCRD: guidelines for the prevention and treatment of cerebrovascular diseases in China; GDTALSC: guidelines for the diagnosis and treatment of acute ischemic stroke in China 2010; GPCRND: guiding principles for clinical research of new drugs of traditional Chinese medicine; GDTALSC: guidelines for the prevention and treatment of cerebrovascular diseases of the Chinese society of traditional Chinese medicine; MPVAKCD: main points of diagnosis of various kinds of cerebrovascular diseases; MPDAKCD: main points of diagnosis of all kinds of cerebrovascular diseases; MPDAKCD: main points of diagnosis of all kinds of cerebrovascular diseases; NR: no report; NE: neurology; OTTCM: other treatments of traditional Chinese medicine; RDCFNCDC: reference to the diagnostic criteria of the fourth National Conference on Cerebrovascular Diseases; SDSDQDBSS: syndrome differentiation standard of qi deficiency and blood stasis syndrome in traditional Chinese medicine; SDTRMC: standard for diagnosis and treatment of rehabilitation medicine in China; SDCEA: scoring standard for diagnostic efficacy of apoplexy; T: trial group; TCMs: traditional Chinese medicines.
| Study ID (name, year) | Treatment group | Control group | Duration/follow-up | Outcome measures |
|----------------------|----------------|--------------|-------------------|------------------|
| **TCMs**             |                |              |                   |                  |
| Wang Yuxiu, 2017     | TCM-1 (3 tablets, tid)+RT | RT          | 8 weeks/NR        | TC, TG, LDL, HDL, hs-CRP, HCY |
| Zhao Xiaoli, 2017    | TCM-3, bid+TCM-4, bid+RT  | RT          | 2 months/NR       | TC, LDL, LG, TG, HCT |
| Chen Si, 2016        | TCM-5, tid+RT       | RT          | 14 days/NR        | hs-CRP, FIB      |
| Li Shefang, 2016     | TCM-6, ivdrip, qd+RT  | RT          | 1 month/NR        | TER, NIHSS       |
| Zhang Kefei, 2018    | TCM-7, po+RT        | RT          | 4 weeks/NR        | TG, TC, NIHSS, Bl, WHV, WLV, PV |
| Zhao Jing, 2016      | TCM-1 (3 tablets, tid)+RT | RT          | 12 months/NR      | TC, TG, LDL, LDH, NIHSS |
| Yang Zhenwei, 2017   | TCM-8, po, qd+RT     | RT          | 3 months/NR       | NIHSS, HCY      |
| Liu Yufeng, 2016     | TCM-2+RT           | RT          | 4 weeks/NR        | FMA, BI         |
| Cao Ying, 2014       | TCM-9, 4 tablets, tid+RT | RT          | 28 days/NR        | TER             |
| Fu Yaping, 2018      | TCM-10, 200 ml/d, bid+RT | RT          | 8 weeks/NR        | TER, SITCM, NIHSS |
| Li Yaorong, 2015     | TCM-11, ivdrip, qd+RT  | RT          | 14 days/NR        | TER, HCT, FIB   |
| Wu Xiuhua, 2018      | TCM-12, 3 tablets, tid+RT | RT          | 3 months/NR       | TER, NIHSS, FIB |
| Chen Rong, 2011      | TCM-13, bid+RT      | RT          | 14 days/NR        | NIHSS, Bl       |
| Zhong Lingyi, 2019   | TCM-2, bid+RT       | RT          | 8 weeks/NR        | TER, hs-CRP     |
| Jia Liang, 2017      | TCM-14, bid+RT      | RT          | 8 weeks/NR        | FMA, BI, HCY    |
| Zhang Jin, 2004      | TCM-15, bid+RT      | RT          | 28 days/NR        | TER, FIB, TG, TC, LGD, HDL |
| Wang Chengtai, 2016  | TCM-16, bid+RT      | RT          | 4 weeks/NR        | TER, hs-CRP, FIB, HCY |
| Niu Ben, 2016        | TCM-17, bid+RT      | RT          | 8 weeks/NR        | TER, BI, HCY    |
| Wang Alii, 2019      | TCM-2, bid+RT       | RT          | 6 weeks/NR        | NIHSS, SITCM, FIB, TER |
| Yuan Li, 2005        | TCM-18, 0.4 g/time, ivdrip +RT | RT          | 28 days/NR        | TER, FIB, TG, TC, LGD, HDL |
| Liu Weicheng, 2017   | TCM-19, tid, 2 bags/time+RT | RT          | 1 month/NR        | TER, TC, TG, FIB, WHV, WLV, PV |
| Li Naiqian, 2017     | TCM-20, 200 ml/d, bid+RT | RT          | 15 days/12 months | NIHSS, Bl, HCY, hs-CRP, FIB |
| Bian Yonghong, 2017  | TCM-21, 200 ml/d, bid+RT | RT          | 8 weeks/NR        | NIHSS, HCT     |
| Lou Fei, 2019        | TCM-22, 3 tablets, tid+RT | RT          | 12 weeks/NR       | NIHSS, HCY, SITCM |
| **ACU**              |                |              |                   |                  |
| Cai Jingjing, 2012   | Acupuncture+RT1    | RT1         | 4 weeks/NR        | ADL             |
| Chen Dan, 2018       | Acupuncture+RT     | RT          | 4 weeks/NR        | SSA, VFSS       |
| Dai Shuqing, 2015    | Acupuncture, qd+RT2 | RT2         | 36 days/NR        | FMA, NIHSS      |
| Deng Xiaodong, 2018  | Acupuncture, qd+RT  | RT          | 3 weeks/NR        | TER, FMA        |
| Du Xin, 2018         | Acupuncture, qd+RT3 | RT3         | 4 weeks/NR        | TER, FMA, BI    |
| Feng Shengwang, 2016 | Acupuncture, qd+RT4 | RT4         | 3 weeks/NR        | TER, VFSS       |
| Fu Qinshui, 2016     | Acupuncture, qd+RT  | RT          | 8 weeks/NR        | FMA, BI         |
| Fu Xiaofeng, 2019    | Acupuncture, qd+RT  | RT          | 4 weeks/NR        | TER, FMA, BI    |
| Gao Ting, 2018       | Acupuncture, qd+RT5 | RT5         | 4 weeks/NR        | TER, FMA, BI, BFG, VEFG |
| Huang Wei, 2018      | Acupuncture, qd+RT  | RT          | 4 weeks/NR        | TER             |
| Jiang Ming, 2018     | Acupuncture, qd+RT6 | RT6         | 4 weeks/NR        | TER, FMA, ADL, NIHSS |
| Lin Biyu, 2018       | Acupuncture, qd+RT7 | RT7         | 20 days/NR        | TER, BI         |
| Liu Sang, 2018       | Acupuncture, qd+RT  | RT          | 2 weeks/NR        | TER, FMA, BI    |
| Peng Shaokun, 2015   | Acupuncture, qd+RT  | RT          | 3 weeks/NR        | TER, BI         |
| Shi Youjia, 2018     | Acupuncture, qd+RT  | RT          | NR/NR             | ADL, NIHSS      |
| Shi Yunhua, 2017     | Acupuncture, qod+RT | RT          | 4 weeks/NR        | TER             |
| Song Yi, 2017        | Acupuncture, qd+RT8 | RT8         | 4 weeks/5 months  | FMA, NIHSS      |
| Tang Youbin, 2014    | Acupuncture, qd+RT  | RT          | NR/NR             | TER, ADL        |
| Wang Jing, 2019      | Acupuncture, qd+RT9 | RT9         | 12 weeks/3 months | ADL             |
| Xiao Yu, 2013        | Acupuncture, qd+RT  | RT          | 12 weeks/NR       | TER             |
3.1.3. Indices of hs-CRP, FIB, and HCY of TCMs Combined with Routine Treatment vs. Routine Treatment Alone. Five studies \([42, 49, 55, 64, 87]\) reported the detection of hs-CRP. There was statistically significant heterogeneity among individual studies \((P < 0.00001, I^2 = 97\%\) ), so a random-effects model was applied to take a meta-analysis which demonstrated that the combination of TCMs and routine treatment significantly decreased the level of hs-CRP \((MD = -0.78, 95\% CI: -1.32, -0.23, P = 0.006, Figure 6(a))\). Nine trials \([22, 23, 40, 42, 49, 55, 57, 81, 84]\) provided the contents of FIB. There was statistically significant heterogeneity among individual studies \((P = 0.08, I^2 = 43\%\) ), so a random-effects model was applied to take a meta-analysis which demonstrated that the combination of TCMs and routine treatment significantly decreased the level of FIB \((MD = -0.39, 95\% CI: -0.49, -0.28, P < 0.00001, Figure 6(b))\). Detection of HCY was reported in seven trials \([41, 42, 54, 55, 64, 65, 81]\). Heterogeneity in individual researches \((P < 0.00001, I^2 = 90\%\) ) and then a random-effects analysis was applied to demonstrate that TCMs and routine treatment significantly decreased the level of HCY \((MD = -2.28, 95\% CI: -3.20, -1.88, P < 0.00001)\). From the results of the meta-analysis, we can know that TCMs combined with routine treatment can significantly diminish the NIHSS score \((MD = -2.54, 95\% CI: -3.20, -1.88, P < 0.00001)\). Eight studies \([24, 39, 56, 61, 71, 73, 79, 83]\) reported the NIHSS in the ACU group. A random-effects model was used because of heterogeneity existence \((P < 0.00001, I^2 = 88\%\) ). From the results of the meta-analysis, we can know that TCMs combined with routine treatment can significantly diminish the NIHSS score \((MD = -2.54, 95\% CI: -3.20, -1.88, P < 0.00001)\). Eight studies \([24, 39, 56, 61, 71, 73, 79, 83]\) reported the NIHSS in the ACU group. A random-effects model was used because of heterogeneity existence \((P < 0.00001, I^2 = 98\%\) ). A meta-analysis showed that ACU combined with routine treatment significantly reduced the NIHSS score \((MD = -4.93, 95\% CI: -7.58, -2.28, P = 0.0003)\). Two studies \([52, 60]\) reported the NIHSS in the OTTCM group. Due to

### Table 2: Continued.

| Study ID (name, year) | Treatment group | Control group | Duration/follow-up | Outcome measures |
|-----------------------|-----------------|---------------|--------------------|------------------|
| Xie Xiaojuan, 2018    | Acupuncture, qd+RT | RT            | 4 weeks/NR         | TER, NIHSS       |
| Xu Lei, 2017          | Acupuncture, qd+RT | RT            | 40 days/NR         | TER, FMA, BI     |
| Xu Wansong, 2017      | Acupuncture, qd+RT | RT            | 40 days/NR         | TER, FMA, BI, NIHSS |
| Zhang Liao, 2018      | Acupuncture, qd+RT10 | RT10       | 10 weeks/NR        | FMA, BI, NIHSS   |
| Zhang Ningxia, 2010   | Acupuncture, qd+RT11 | RT11       | 3 weeks/NR         | TER, FMA, BI, NIHSS |
| Zhou Minya, 2016      | Acupuncture, qd+RT | RT            | 4 weeks/NR         | TER, BI          |
| Zhou Shuxin, 2018     | Acupuncture, qd+RT12 | RT12       | 4 weeks/NR         | IgA, IgG, IgM    |

ADL: evaluation result of activities of daily living; bid: twice a day; BI: Barthel Index; BFGF: serum fibrillar growth factor; CSI: clinical spasticity index; FMA: Fugl-Meyer Assessment; FIB: fibrinogen; hs-CRP: hypersensitive C-reactive protein; HDL: high-density lipoprotein; HCY: homocysteine; HCT: hematocrit; ivdrip: intravenous drip; IgA: immunoglobulin A; IgG: Immunoglobulin G; IgM: immunoglobulin M; LDL: low-density lipoprotein; MRS: modified Rankin scale; NIHSS: National Institutes of Health Stroke Scale; pe: oral administration; PV: plasma viscosity; qd: once a day; RT: routine treatment; SITCM: syndrome integral of traditional Chinese medicine; SSA: standardized swallowing assessment; SSIEAC: self-made square internal and external application combined with puncture and cupping; SWM: scrapping with moxibustion; TER: total efficacy rate; TC: total cholesterol; TG: triglyceride; tid: three times a day; VEGF: vascular endothelial growth factor; VFSS: videofluoroscopy swallowing study; WHV: whole high viscosity; WLV: whole low viscosity.
| Drugs         | Prescription name                        | Composition                                                                 | Prescription | Source                  |
|--------------|------------------------------------------|-----------------------------------------------------------------------------|--------------|-------------------------|
| TCM-1        | Yindan Xinnao Tong soft capsule          | Ginkgo Folium, Salviae Mhiiorrhizae Radix et Rhizoma, Erigeron brevicae, Gynostemma pentaphyllum, Crataegi Fructus, Allii sativum Bulbus, Notoginseng Radix et Rhizoma, L-Borneolum |             | 《Chinese Pharmacopoeia》 |
| TCM-2        | Buyang Huanwu decoction                  | Astragali Radix, Angeticae Sinensis Radix, Paeoniae Radix Rubra, Pheretima, Chuanxiong Rhizoma, Carthami Flos, Persicae Semen |             | 《Yi Lin Gai Cuo》      |
| TCM-3        | Added flavor of Buzhong Yiqi decoction   | Astragali Radix 30g, Codonopsis 20g, (Angeticae Sinensis Radix, Atractylodis Macrocephale Rhizoma, Alismatis Rhizoma, Bupleuri Radix, Rehmanniae Radix, Pueraiae Lobatae Radix, Chuanxiong Rhizoma, Achyranthis Bidentatae Radix) 15g, (Ophiopogonis Radix, Gastrodiae Rhizoma) 12g, (Pheretima, Citri Reticulatae Pericarpium, Carthami Flos) 9g | Buzhongyiqi decoction | 《Yi Lin Gai Cuo》      |
| TCM-4        | Shenmatongluo capsules                   |                             |             | 《Chinese Pharmacopoeia》 |
| TCM-5        | Shenqi Fuzheng injection                 | Codonopsis, Astragali Radix                                                 |             | 《Chinese Pharmacopoeia》 |
| TCM-6        | Shuxuetong injection                     | Hirudo, Pheretima                                                           |             | 《Chinese Pharmacopoeia》 |
| TCM-7        | Pinggan Ditan Tongluo decoction          | Gastrodiae Rhizoma 10 g, Uncariae Ramulus cum Uncis 20 g, Salviae Mhiiorrhizae Radix et Rhizoma 15 g, Notoginseng Radix et Rhizoma 15 g, Angeticae Sinensis Radix 15 g, Chuanxiong Rhizoma 15 g, Acori Tatarinowii Rhizoma 10 g, Persicae Semen 10 g, Carthami Flos 10 g, Glycyrrhizae Radix et Rhizoma 6 g | Kang Xian Jian | Self-formulation        |
| TCM-8        | Quyu Huatan Tongfu recipe                |                             |             | 《Liu Yin Tiao Bian》 |
| TCM-9        | Naoxintong capsule                       |                             |             | 《Chinese Pharmacopoeia》 |
| TCM-10       | Yiqi Huoxue Tongluo Tang                 |                             |             | 《Yi Lin Gai Cuo》      |
| TCM-11       | Shuxuening injection                     | Ginkgo Folium                                                              |             | 《Chinese Pharmacopoeia》 |
| TCM-12       | Maixuekang capsule                       | Hirudo                                                                      |             | 《Chinese Pharmacopoeia》 |
| TCM-13       | Modified Buyang Huanwu decoction         |                             |             | 《Yi Lin Gai Cuo》      |
the existence of heterogeneity, the random-effects model is adopted \((P = 0.006, I^2 = 87\%)\). A meta-analysis illustrated that the combination of OTCM and routine therapy could greatly lessen the NIHSS score \((MD = −3.40, 95\% CI: −7.45, 0.65, P = 0.10, \text{Figure 7})\).

### 3.1.5. Indices of BI of TCMs, ACU, or OTTCM Combined with Routine Treatment vs. Routine Treatment Alone.

The BI was mentioned in 6 tests \([25, 41, 51, 54, 55, 70]\) in the TCM group. There was no statistically significant heterogeneity among individual trials \((P = 0.63, I^2 = 0\%)\). A meta-analysis demonstrated that TCMs combined with routine treatment significantly improved the BI score \((MD = 11.08, 95\% CI: 9.85, 12.30, P < 0.00001)\). 12 studies \([24, 38, 45, 46, 53, 56, 66, 71, 74, 76, 80, 88]\) reported the BI in the ACU group. A random-effects model was used because of heterogeneity existence \((P < 0.00001, I^2 = 89\%)\). A meta-analysis showed that ACU combined with routine treatment significantly

| Drugs | Prescription name | Composition | Prescription | Source |
|-------|-------------------|-------------|--------------|--------|
| TCM-14 | Traditional Chinese medicine for tonifying qi and promoting blood circulation | Acori Tatarinowii Rhizoma 15 g, Angelicae Dahuricae Radix 8 g | Buyang Huanwu decoction | Yi Lin Gai Cuo
| TCM-15 | Gegen huangqi soup | Astragali Radix 30 g, Codonopsis 20 g, Achyranthis Bidentatae Radix 20 g, Pheretima 15 g, Taxilli Herba 15 g, Spatholobi Caulis 25 g, Angeticae Sinensis Radix 8 g, Eucommiae Cortex 10 g, common clubmoss herb Latin 10 g, Glycyrrhizae Radix et Rhiza 10 g | Zhufeng Tongbi decoction | Yi Lin Gai Cuo
| TCM-16 | Qi-tonifying and stasis-eliminating therapy | Astragali Radix 30 g–60 g, Puerariae Lobatae Radix 30 g, Salviae Miihiorrhizae Radix et Rhiza 12 g, Bombbyx Batryticatus 10 g, Spatholobi Caulis 25 g, Angeticae Sinensis Radix 6 g, cicada slough 10 g, Scorpion 5 g | Buyang Huanwu decoction | Yi Lin Gai Cuo
| TCM-17 | Buqi Jiannao Tongluo Tang | Astragali Radix 60 g, Codonopsis 20 g, Angeticae Sinensis Radix 10 g, Paeoniae Radix Rubra 10 g, Chuanxiong Rhizoma 10 g, Achyranthis Bidentatae Radix 15 g, Pheretima 15 g, Taxilli Herba 15 g, Eucommiae Cortex 10 g, Chaenomelis Fructus 10 g, common clubmoss herb Latin 10 g, Stephaniae Tetrandrae Radix 15 g, Hirudo 10 g, Spatholobi Caulis 15 g, Platycodonis Radix 10 g, Glycyrrhizae Radix et Rhiza 10 g | Buyang Huanwu decoction | Yi Lin Gai Cuo
| TCM-18 | Puerarin | Puerariae Lobatae Radix | Buyang Huanwu decoction | Chinese Pharmacopoeia
| TCM-19 | Lemai granule | Salviae Miihiorrhizae Radix et Rhiza, Chuanxiong, Rhizoma, Paeoniae Radix Rubra, Carthami Flos, Cypere Rhizoma, Aucklandiae Radix, Crataegi Fructus | Buyang Huanwu decoction | Chinese Pharmacopoeia
| TCM-20 | Yiqi Huoxue Huatan Tongluo decoction | Astragali Radix 30 g, Paeoniae Radix Rubra 25 g, Angeticae Sinensis Radix 10 g, (Persicae Semen, Chuanxiong Rhizoma, Citri Reticulatae Pericarpium, Bambusae Caulis in Taenias, Pinelliae Rhizoma Praeparatum, Aurantii Fructus Immaturus, Acori Tatarinowii Rhizoma, Polygalae Radix) 10 g, (Carthami Flos, Glycyrrhizae Radix et Rhiza) 6 g | Buyang Huanwu decoction | Yi Lin Gai Cuo
| TCM-21 | Qingnao Shuluo decoction | Astragali Radix 30 g, Paeoniae Radix Rubra 10 g, Angeticae Sinensis Radix 10 g, Pheretima 15 g, Taxilli Herba 15 g, Eucommiae Cortex 10 g, Chuanxiong Rhizoma 10 g, Achyranthis Bidentatae Radix 15 g, Spatholobi Caulis 30 g, Taxilli Herba 15 g, Achyranthis Bidentatae Radix 15 g, Liquidambaris Fructus 20 g, Crataegi Fructus 15 g | Buyang Huanwu decoction | Yi Lin Gai Cuo
| TCM-22 | Peiyuan Tongzhi capsule | Polygoni Multiflori Radix, Rehmanniae Radix, Cervi Cornu Pantotrichum, Cistanches Herba, Cinnamomi cortex, Scorpion, Pheretima, Hirudo, Paeoniae Radix Rubra, Poria, fried Crataegi Fructus, Glycyrrhizae Radix et Rhiza | Buyang Huanwu decoction | Chinese Pharmacopoeia
improved the BI score (MD = 13.27, 95% CI: 9.73, 16.81, P < 0.00001). Eight studies [27, 28, 30, 32, 33, 36, 67, 69] reported the BI in the OTTCM group. A random-effects model was used because of heterogeneity existence (P < 0.00001, I² = 97%). A meta-analysis demonstrated that OTTCM combined with routine treatment significantly decreased the BI (MD = 9.24, 95% CI: 5.57, 12.92, P < 0.00001, Figure 8).

3.1.6. Indices of FMA of ACU or OTTCM Combined with Routine Treatment vs. Routine Treatment Alone. 13 studies [24, 39, 46, 53, 56, 61, 71, 73, 74, 76, 78, 80, 88] reported the FMA in the ACU group. A random-effects model was used because of heterogeneity existence (P < 0.00001, I² = 99%). A meta-analysis showed that ACU combined with routine treatment significantly improved the FMA score (MD = 13.00, 95% CI: 9.73, 16.26, P < 0.00001). 11 studies [27, 28, 31–33, 36, 37, 50, 58, 69, 72] reported the FMA in the OTTCM group. A random-effects model was used because of heterogeneity existence (P < 0.00001, I² = 99%). The consequences exhibited that OTTCM combined with routine treatment could significantly meliorate the FMA.

### Table 4: Acupoint control table.

| Study ID (name, year) | Acupoint |
|-----------------------|----------|
| Cai Jing-jing, 2012   | Jianliao, Quchi, Hegu, Huantiao, Yanlingquan, Zusani, Xuanzhong, Jiexi, Kunlun, Taichong, Dicang, Yingxiang, Jiachengjiang, Lianquan |
| Chen Dan, 2018        | Lianquan, Fengchi, Fengfu |
| Dai Shu-qing, 2015    | Guanyuan, Qihai, Zusani, Jianzhen, Naoshu, Bingfeng, Tianzong, Quyuan, Jianwaishu, Jianzhongshu, Jianyu, Quchi, Hegu |
| Deng Xiao-dong, 2018   | Biguan, Xuehai, Xuanzhong, Yanglingquan, Huantiao, Fengshi, Quxu, Fenglong, Zusani |
| Du Xin, 2018          | Baihui, Taiyang, Fengchi, Zusani, Zhibian, Xiyan, Yanglingquan, Huantiao, Jiexi, Zhongfeng, Hegu |
| Feng Sheng-wang, 2016  | Lianquan, Yifeng, Fengchi, Wangu, Fengfu, Yamen, Daying, Jinjin |
| Fu Qin-hui, 2016       | Shenting, Baihui, Hegu, Fenglong, Jianyu, Quchi, Waiguan, Yanglingquan, Zusani, Tianjin, Naohui, Weizhong, Chengshan, Taichong, Shangjuxu, Taixi, Qihai, Shenshu |
| Fu Xiao-feng, 2019     | Huatuojiaji, Renying, Baihui |
| Gao Ting, 2018         | Quchi, Waiguan, Hegu, Zusani, Houxi, Weizhong, Yanglingquan, Huantiao, Jiegu, Kunlun |
| Huang Wei, 2018        | Sishen cong, Xuanli, Baihui, Qubin |
| Jiang Ming, 2018       | Baihui, Renzhong, Dicang, Shousani, Quchi, Neiguan, Hegu, Waiguan, Jianliao, Shaoze, Zusani, Huantiao, Yanglingquan, Fengshi, Xuehai, Chengshan, Yinlingquan, |
| Lin Bi-yu, 2018        | Hegu, Quchi, Baihui, Shenting, Sishen cong, Neiguan, Waiguan, Zusani, Taichong, Taixi, Fengchi, Jiqian, Chize |
| Liu Sang, 2018         | Zusani, Yanglingquan, Weizhong, Huantiao, Quchi, Hegu, Xinshu, Geshu, Shenshu, Dazhui, Baihui, Renzhong, Taichong, Neiting, Cuanzhu, Dicang, Futu 1, Jiache, Yangbai, Tianju, Fenglong, Xuehai, Qihai, Tai, Guanyuan |
| Peng Shao-kun, 2015    | Renzhong, Jianyu, Waiguan, Quchi, Chize, Taixi, Taichong, Weizhong, Huantiao, Neiguan, Sanyin jiao, Shousani, Hegu, Tianfu, Shaozhai, Zusani, Yongquan, Ji jian, Xuehai, Fenglong |
| Shi You-jia, 2018      | Yongquan, Zusani, Fenglong, Yanglingquan, Weizhong, Hegu, Neiguan, Shuigou, Quchi, Chize, Sanyin jiao, Baihui |
| Shi Yun-hua, 2017      | Renzhong, Baihui, Sishen cong, Yintang, Neiguan, Zusani, Sanyin jiao, Xuehai, Jiegu, Weizhong, Chize |
| Song Yi, 2017          | Baihui, Taiyang, Fengchi, Jianyu, Quchi, Hegu, Baxie, Zhibian, Huantiao, Xiyan, Yanglingquan, Zusani, Quxu, Taichong, Fenglong, Taixi |
| Tang You-bin, 2014     | Tianzong, Yangchi, Wangu |
| Wang Jing, 2019        | Baihui, Yintang, Neiguan, Waiguan, Taixi, Danshu, Geshu, Yongquan, Xinshu, Shenshu |
| Xiao Yu, 2013          | Renzhong, Jiegu, Tongli, Neiguan, Jiegu, Zusani, Sanyin jiao, Yongquan, Jianyu, Quchi, Jianqia, Waiguan, Houxi, Jianzhen, Lie que, Jianqian, Guanyuan |
| Xie Xiao-juan, 2018    | Sanyin jiao, Shenmen, Sishen cong, Shenting, Taichong, Neiguan, Taixi |
| Xu Lei, 2017           | Huatuojiaji, Jianyu, Quchi, Waiguan, Hegu, Huantiao, Futu 1, Zusani, Xuanzhong, Quxu, Kunlun |
| Xu Wan-song, 2017      | Renzhong, Baihui, Hegu, Quchi, Neiguan, Waiguan, Sanyin jiao, Zusani, Yanglingquan |
| Zhang Liao, 2018       | Renzhong, Neiguan, Sanyin jiao, Weizhong, Jiegu, Chize |
| Zhang Ning-xia, 2010   | Jianyu, Quchi, Hegu, Yanglingquan, Yinlingquan, Zusani, Sanyin jiao |
| Zhou Min-ya, 2016      | Baihui, Sishen, Shenting, Neiguan, Shenmen, Sanyin jiao |
| Zhou Shu-xin, 2018     | Shang juxu, Zusani, Taiyang, Yifeng, Qianzhu, Fengchi, Taichong, Cuanzhu, Yingxiang, Sibai, Jingming, Jiache, Chengjiang, Renzhong |
Compared with routine treatment alone (significant increase in the TCMs+routine treatment compared with routine treatment alone (P = 0.01, Table 6).

3.1.7. Hemorheological Indices of TCMs Combined with Routine Treatment vs. Routine Treatment Alone. Hemorheological indices were reported in eligible studies including WHV, WLV, PV, and HCT. Two trials [57, 70] mentioned the WHV and PV level. The MD with 95% CI for WHV and PV were (MD = −0.89, 95% CI: −1.04, −0.74) and (MD = −0.49, 95% CI: −0.68, −0.31), respectively, indicating a significant decrease in the hemorheological indices in the experimental group compared with the control group (P < 0.00001). Two trials [57, 70] mentioned the investigation on WLV. The MD with 95% CI for WLV was (MD = −2.30, 95% CI: −4.24, −0.36) certifying a significant increase in the TCMs+routine treatment compared with routine treatment alone (P = 0.02). Three trials [40, 59, 62] mentioned the investigation on HCT. The MD with 95% CI for HCT was (MD = −2.65, 95% CI: −4.71, −0.58) certifying a significant increase in the TCMs and routine treatment compared with routine treatment alone (P = 0.01, Table 6).

3.1.8. Serum Immunoglobulin of ACU Combined with Routine Treatment vs. Routine Treatment Alone. Serum immunoglobulin was reported in eligible studies including IgA, IgG, and IgM. The serum levels of IgA, IgG, and IgM were measured in one study [75]. The MD with 95% CI for IgA, IgG, and IgM were (MD = −0.77, 95% CI: −1.09, −0.45), (MD = −1.87, 95% CI: −2.51, −1.23), and (MD = −0.91, 95% CI: −1.23, −0.59), respectively, indicating a significant decrease in the serum immunoglobulin in the experimental group compared with the control group (P < 0.00001, Table 7).

3.1.9. Observation Index of OTTCM Combined with Routine Treatment vs. Routine Treatment Alone. One study [72] reported the CSI, one trial [69] provided MOCA, and two trials [43, 67] recorded MRS. The MD with 95% CI for CSI was (MD = −1.26, 95% CI: −1.95, −0.57), indicating a significant decrease of CSI in the experimental group (P = 0.0004). The MD with 95% CI for MOCA was (MD = 3.39, 95% CI: 1.04, 5.74), indicating a significant increase of MOCA in the experimental group (P = 0.005). The MD with 95% CI for MRS
was (MD = −0.61, 95% CI: −0.81, −0.42), indicating a significant decrease of MRS in the experimental group (P < 0.00001, Table 8).

### 3.1.1 Swallowing Function Score of ACU Combined with Routine Treatment vs. Routine Treatment Alone. Swallowing function evaluation including SSA and VFSS. One study [68] reported the SSA; two trials [48, 68] provided VFSS. The MD with 95% CI for SSA was (MD = −3.40, 95% CI: −4.99, −1.81), indicating a significant decrease of SSA in the experimental group (P < 0.00001). The MD with 95% CI for VFSS was (MD = 2.44, 95% CI: 1.74, 3.14),

| Study or subgroup | Experimental Events | Control Events | Weight | Odds ratio M-H, fixed 95% CI | Odds ratio M-H, fixed 95% CI |
|-------------------|---------------------|----------------|--------|-----------------------------|-----------------------------|
| **1.1.1 TCMs-TER** |                     |                |        |                             |                             |
| Cao Ying 2014     | 174                 | 198            | 57     | 65                          | 9.8%                        |
| Fu Yaping 2018    | 54                  | 58             | 46     | 58                          | 3.0%                        |
| Li Shefang 2016   | 38                  | 40             | 28     | 40                          | 1.3%                        |
| Li Yaorong 2015   | 30                  | 33             | 26     | 33                          | 2.2%                        |
| Liu Weicheng 2017 | 47                  | 52             | 36     | 50                          | 3.3%                        |
| Niu Ben 2016      | 42                  | 48             | 33     | 48                          | 3.9%                        |
| Wang Chengtao 2016| 45                  | 62             | 27     | 63                          | 6.9%                        |
| Wu Xinhua 2018    | 57                  | 65             | 47     | 65                          | 5.5%                        |
| Yang Zhenwei 2017 | 30                  | 33             | 21     | 32                          | 1.8%                        |
| Zhang Jilin 2004  | 72                  | 76             | 50     | 60                          | 2.8%                        |
| Zhang Kefei 2018  | 53                  | 58             | 44     | 58                          | 3.6%                        |
| Zhang Lingyi 2019 | 51                  | 53             | 44     | 53                          | 1.6%                        |
| Subtotal (95% CI) | 776                 | 625            | 45.7%  |                             |                             |

Total events 693 459
Heterogeneity: chi² = 9.37, df = 11 (P = 0.97); I² = 0%
Test for overall effect: Z = 7.25 (P < 0.00001)

| **1.1.2 ACU-TER** |                     |                |        |                             |                             |
| Deng Xiao-dong 2018| 66                  | 73             | 55     | 73                          | 5.0%                        |
| Du Xin 2018       | 32                  | 35             | 25     | 35                          | 2.0%                        |
| Feng Sheng-wang 2016| 26                | 30             | 20     | 30                          | 2.5%                        |
| Fu Xiao-feng 2019 | 32                  | 34             | 18     | 26                          | 1.1%                        |
| Gao Ting 2018     | 43                  | 46             | 34     | 46                          | 2.1%                        |
| Huang Wei 2018    | 92                  | 98             | 71     | 98                          | 4.1%                        |
| Jiang Ming 2018   | 56                  | 58             | 42     | 58                          | 1.4%                        |
| Lin Biao 2018     | 44                  | 45             | 33     | 45                          | 0.7%                        |
| Liu Sang 2018     | 75                  | 82             | 66     | 82                          | 5.3%                        |
| Peng Shao-kun 2015| 35                  | 38             | 26     | 38                          | 1.9%                        |
| Shi Yun-hua 2017  | 38                  | 40             | 29     | 40                          | 1.4%                        |
| Tang You-bin 2014 | 30                  | 34             | 23     | 34                          | 2.6%                        |
| Xiao Yu 2013      | 66                  | 68             | 40     | 50                          | 1.3%                        |
| Xie Xiao-juan 2018| 40                  | 43             | 32     | 40                          | 2.2%                        |
| Xu Lei 2017       | 27                  | 30             | 22     | 30                          | 2.1%                        |
| Xu Wan-song 2017  | 41                  | 42             | 35     | 42                          | 0.8%                        |
| Zhang Jing-xia 2010| 35                | 40             | 27     | 40                          | 3.2%                        |
| Zhou Min-ya 2016  | 53                  | 58             | 43     | 58                          | 3.5%                        |
| Subtotal (95% CI) | 894                 | 641            | 865    | 43.1%                       | 4.60 [3.41, 6.21]           |

Total events 831
Heterogeneity: chi² = 7.62, df = 17 (P = 0.97); I² = 0%
Test for overall effect: Z = 10.00 (P < 0.000001)

| **1.1.3 OTTCM-TER** |                     |                |        |                             |                             |
| Ding Min 2018      | 38                  | 40             | 30     | 39                          | 1.4%                        |
| Li Chaoming 2018   | 42                  | 43             | 34     | 43                          | 0.7%                        |
| Nie Bin 2013       | 36                  | 42             | 26     | 40                          | 2.0%                        |
| Qi Jiangmin 2015   | 38                  | 41             | 20     | 39                          | 1.4%                        |
| Yan Jiang 2017     | 47                  | 49             | 41     | 49                          | 1.6%                        |
| Zhao Yang 2017     | 33                  | 39             | 25     | 39                          | 3.6%                        |
| Subtotal (95% CI)  | 252                 | 249            | 11.2%  |                             |                             |

Total events 234 176
Heterogeneity: chi² = 2.95, df = 5 (P = 0.71); I² = 0%
Test for overall effect: Z = 6.06 (P < 0.00001)
Test for subgroup differences: chi² = 5.13, df = 2 (P = 0.08); I² = 61.0%

**Figure 4:** Forest plot of TER treated with TCMs, ACU, and OTTCM alone.
indicating a significant increase of VFSS in the experimental group ($P < 0.00001$). Five trials [26, 35, 73, 83, 86] provided ADL. The MD with 95% CI for ADL was (MD = 14.04, 95% CI: 7.23, 20.86), indicating a significant increase of ADL in the experimental group ($P < 0.00001$, Table 9).

3.1.11. BFGF and VEGF Expression Levels of ACU Combined with Routine Treatment vs. Routine Treatment Alone. One study [76] reported the BFGF; one trial [76] provided VEGF. The MD with 95% CI for BFGF and VEGF were (MD = 3.90, 95% CI: 2.86, 4.94) and (MD = 272.24, 95% CI: 261.12, 283.36), respectively, indicating a significant

![Figure 5: Forest plot of indices of blood lipid in patients treated with TCMs and routine treatment. (a) The plot of TC, (b) the plot of TG, (c) the plot of LDL, and (d) the plot of HDL.](image-url)
Rhizoma, etc., have an obvious recovery improvement. Rheum Palmatum, Asari Radix et Rhizoma and Achyranthes Bidentatae Radix can enhance the recovery improvement. As can be seen from Figure 10(b), the NIHSS, SITCM. Figure 10(c) can be obtained, common clubmoss taima and Achyranthis Bidentatae Radix can enhance the recovery e

3.2. Analysis Diagram of TCM-Index Network Relationship. 72 Chinese herbs and 18 related indexes were imported into the Cytoscape3.7.1 software to draw the network analysis map as shown in Figure 10(a). Through the ClusterViz plug-in Cytoscape, four core modules are obtained by using the EAGLE algorithm, as shown in Figures 10(b)–10(e). It can be obtained from Figure 10(a) that TCMs have an obvious recovery effect on all indexes of the apoplexy recovery period. As can be seen from Figure 10(b), the NIHSS, STTCM, and hs-CRP are important indicators of stroke recovery improvement. Rheum Palatum, Asari Radix et Rhizoma, etc., have an obvious effect on the NIHSS. Phere-tima and Achyranthis Bidentatae Radix can enhance the SITCM. Figure 10(c) can be obtained, common clubmoss

3.3. Analysis Diagram of Acupoint-Index Network Relationship. The 95 acupoints and 16 related indexes were imported into the Cytoscape 3.7.1 software to draw the network analysis diagram in Figure 11(a) through the ClusterViz plug-in Cytoscape; four core modules were obtained by

increase in the experimental group (P < 0.00001, Table 10).

Figure 6: Forest plot of indices of hs-CRP, FIB, and HCY function in patients treated with TCMs and routine treatment. (a) The plot of hs-CRP, (b) the plot of FIB, and (c) the plot of HCY.
using the EAGLE algorithm, see Figures 11(b)–11(e). According to Figure 11(a), the following acupoints have obvious effects on the indexes of the stroke recovery stage. As can be seen from Figure 11(b), the NIHSS and FMA are important indicators of stroke recovery improvement. As can be obtained in Figure 11(c), Zusani (ST36), Renzhong (GV26), Taiyang (EX-HN5), and other acupoints have a significant effect on the serum immunoglobulin index (IgG, IgA, and IgM). Figure 11(d) shows that YinLingquans (SP9), XuanZhong (GB39), Shenshu (BL23), and other acupoints can significantly improve the score of ADL. Figure 11(e) shows that Quchi (LI11), Kunlun (BL60), Hegu, and other acupoints have an obvious effect on BFGF. Yanglingquan (SP9), Weizhong (BL40), and Waiguan (TE5) have a significant effect on VEGF. Quchi (LI11), Kunlun (BL60), and Hegu (LI4) have a good effect on improving the BI (Figure 11).

3.4. Analysis Diagram of OTTCM-Index Network Relationship. Four kinds of other TCM treatment methods and 8 related indexes are imported into the Cytoscape 3.7.1 software to draw the network analysis map as shown in Figure 12. From the picture, we can see that moxibustion, needle knife, scraping, and internal and external application combined with cupping and other TCM therapy have a significant effect on FMA, CSI, NIHSS, and other indicators (Figure 12).

3.5. Publication Bias. In this study, funnel plots are used to represent publication bias. In this study, funnel plots of a combination of TCM treatment and routine treatment vs. routine treatment alone on NIHSS, BI, TER, and hs-CRP were applied. The plot is generally symmetrical, indicating that there is no obvious publication bias (Figure 13). Egger’s test was further executed to examine the publication bias by meta for a package in R platform. We can find that the total NIHSS has publication bias. This is because the OTTCM group only included two articles, so that the Egger’s test could not be performed. The hs-CRP indicator also has a publication bias, which may be caused by the small number of documents included (Table 11).

4. Discussion

Stroke originated from “Huangdi Neijing,” which is the name of traditional Chinese medicine (TCM). Its clinical
manifestations are suddenly faint, hemiplegia, sluggish speech, and tongue skew. It is characterized by acute illness and rapid change, just like the wind [89]. An updated definition of stroke is an acute episode of focal dysfunction of the brain, retina, or spinal cord lasting longer than 24 h. The traditional definition of stroke is clinical and based on the sudden onset of loss of focal neurological function due to infarction or hemorrhage in the relevant part of the brain, retina, or spinal cord [3]. Stroke in the World Health Organization (WHO) is defined as an interruption of blood supply to the brain, usually due to rupture of blood vessels or occlusion of blood clots. Through a large number of reports and authoritative statistical data, it is confirmed that China has become a high-level country of cerebrovascular diseases. Stroke is not only valued in China but also one of the diseases that have aroused great attention in the world [89]. Stroke is also one of the major causes of death worldwide, with about 5.5 million people dying from it every year. The sequelae of stroke also have a significant impact on the quality of life and financial burden of patients and their families. It is estimated that there are about 44 million disability-adjusted life years for stroke survivors, which is the main cause of long-term disability and consumes huge socioeconomic and medical resources [90]. However, long-term disabilities and high recurrence rates remain a cause for concern and pending, prompting patients and their families to seek assistance in complementary therapy [90].

In China, stroke is treated using TCM, which has been developed over thousands of years [18]. The treatment of TCM mainly includes natural medicine, ACU, and physiotherapy. Natural medicine is not only an undeveloped biological resource but also the origin of many new drugs. Among human beings, TCM has a history of more than 2000 years. The precious experience provided by this practice can offer powerful leads for drug discovery [91]. ACU has been proven to lower the risk of stroke recurrence and might be beneficial for muscle spasticity, joint pain, and dysphagia after stroke [90]. At present, the curative effect of western medicine alone in convalescent patients with cerebral infarction is not ideal, and in recent years, a number of studies have confirmed that

![Figure 8: Forest plot of the BI treated with TCMs, ACU, and OTTCM alone.](image-url)
lar endothelial damage, vascular sclerosis, and increased TC, and LDL, will increase platelet adhesion, facilitate platelet aggregation, lead to blood coagulation, and lead to vascular endothelial damage, vascular sclerosis, and increased vascular resistance, thereby boosting the development of atherosclerosis. Finally, the degree of hypoxia and ischemia of brain tissue was aggravated. Plasma LDL concentration is a risk factor for ischemic stroke [92]. Therefore, the improvement of hemorheology and blood lipid indexes is of great significance for the treatment of cerebral infarction. Here, we confirm that TCMs protect blood vessels by reducing the content of TC (P < 0.0001), TG (P < 0.0001), and LDL (P < 0.0001), increasing the levels of HDL (P = 0.001).

In recent years, clinical reports have shown that there is a significant correlation between dyslipidemia and the occurrence and development of cerebrovascular disease [64]. Abnormal metabolism of blood lipids, such as elevated TG, TC, and LDL, will increase platelet adhesion, facilitate platelet aggregation, lead to blood coagulation, and lead to vascular endothelial damage, vascular sclerosis, and increased vascular resistance, thereby boosting the development of atherosclerosis. Finally, the degree of hypoxia and ischemia of brain tissue was aggravated. Plasma LDL concentration is a risk factor for ischemic stroke [92]. Therefore, the improvement of hemorheology and blood lipid indexes is of great significance for the treatment of cerebral infarction. Here, we confirm that TCMs protect blood vessels by reducing the content of TC (P < 0.0001), TG (P < 0.0001), and LDL (P < 0.0001), increasing the levels of HDL (P = 0.001).

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The study found that low hs-CRP (high-sensitivity C-reactive protein) appeared to be associated with a reduced risk of accidental stroke [93]. Based on this, the measurement of hs-CRP has been recommended as a marker of low-grade vessel inflammation in patients at high risk for atherosclerosis in several major guidelines for primary stroke prevention [94]. Fibrinogen (FIB) is an important coagulation factor that plays an important role in regulating thrombosis [95]. FIB is a crucial coagulation factor, which can form a reticular structure in plasma. It is an important factor in plasma viscosity and an independent risk factor for cerebral arteriosclerosis. Epidemiological evidence and Mendelian randomization studies indicate that high homocysteine concentrations in the blood are a risk factor for stroke [96]. Here, we found that the medications from TCMs could not only decrease the serum level of hs-CRP ($P = 0.006$) and FIB ($P < 0.00001$) but also decrease HCY ($P < 0.00001$).

The National Institutes of Health Stroke Scale (NIHSS) and Barthel Index (BI) are widely applied scales in stroke...
Figure 10: Continued.
Figure 10: Continued.
Figure 10: Analysis diagram of TCM-index network relationship.
Figure 11: Continued.
Figure 11: Continued.
The NIHSS is an effective and repeatable scale for measuring neurological deficits and is the most commonly used scoring system in stroke intervention trials. The NIHSS reacts to the infarct size, clinical severity, and long-term outcome. The Barthel, originally described in 1955 by Dr. Florence Mahoney and Dorothea Barthel, is a 10-item measure of activities of daily living. Barthel is also a frequently used functional outcome measure for clinical stroke trials, second only to the modified Rankin scale (MRS) in prevalence. In stroke medicine, Barthel quantifies ADL in an ordinal, hierarchical scale that ranges from 0 to 20 or 0 to 100 depending on the scoring used. We provided that TCM treatment not only decreased the NIHSS score ($P < 0.00001$) but also increased the Barthel Index ($P < 0.00001$).

The FMA (Fugl-Meyer Assessment) was designed by Fugl-Meyer et al. to provide a numeric score of motor status after stroke based on the sequential stages of motor recovery described by Twitchell, Reynolds et al., and Brunnstrom using measures such as limb synergy and range of motion. FMA is considered by many people in the field of stroke rehabilitation to be one of the most comprehensive quantitative measures of poststroke dyskinesia and has been recommended for clinical trials of stroke rehabilitation. Here, we found that OTTCM and ACU could significantly increase FMA scoring ($P < 0.00001$).

Patients with cerebral infarction usually have a variety of abnormal hemorheological indexes, and the blood often shows a state of high aggregation, resulting in an insufficient supply of oxygen and blood to the local tissue of the brain, resulting in local cerebral necrosis. The results of this study showed that the levels of WHV ($P < 0.00001$), WLV ($P = 0.02$), PV ($P < 0.00001$), and HCT ($P = 0.01$) in the experimental group after treatment were critically lower than those in the control group, indicating that the medications from TCMs can reduce the three levels and improve the abnormal hemorheology of patients.

Immunity is a key factor in the pathobiology of stroke. In the state of abnormal immunity, the abnormal increase of serum IgA, IgG, and IgM levels will lead to or aggravate the inflammatory reaction in the convalescent stage of stroke and further aggravate the severity of stroke. In this study, the levels of serum IgA ($P < 0.00001$), IgG ($P < 0.00001$), and IgM ($P < 0.00001$) in the experimental group were tremendously lower than those in the control group.
Figure 13: Continued.
This result indicates that ACU may contribute to the regulation of immune function in the recovery phase after stroke, although its possible impact is not great. But we can pay more attention to other indicators later.

The modified Rankin score (MRS) was assigned retrospectively by a board-certified neurologist using all the information available. The MRS is a commonly used outcome classification system for indicating the level of disability after cerebral stroke [104]. Mild cognitive impairment in post-stroke convalescence is usually screened by the Montreal Cognitive Assessment (MOCA) [105]. The clinical spasticity index (CSI) is a brief, easily administered instrument that is developed for use in preventive clinical practice to identify the strain of informal care providers. The CSI has been applied in many studies to assess the impact of nursing on stroke patients [106]. The MRS \( (P < 0.0001) \), MOCA \( (P < 0.005) \), and CSI \( (P < 0.0004) \) of stroke convalescent patients were meliorated in varying degrees compared to the control group. It shows that OTTCM has a good clinical effect in the treatment of convalescent state after stroke and improves the ability of daily life of patients, so it is worthy of clinical application.

The videofluoroscopy swallow study (VFSS) is considered the gold standard for the detection of swallowing dysfunction [107]. The higher the score, the better the swallowing function. A standardized swallowing assessment (SSA) identified dysphagia and then severity (between 15 and 60 days after stroke) were rated at the time of participation using the VFSS [108]. The higher the score, the worse the swallowing function. In this study, the scores of SSA \( (P < 0.0001) \) and VFSS \( (P < 0.00001) \) in the experimental group were vitally improved compared with those in the control group. These results
suggest that ACU is helpful to improve the swallowing function of convalescent patients after stroke.

BFGF and VEGF are neurotrophic factors and vasoactive peptides, which can directly repair injured nerve tissue, induce a large number of neovascularizations, enhance microcirculation, lighten brain edema, and play a neuroprotective role [76]. Recent evidence has revealed an important role for vascular endothelial growth factor (VEGF) as a neurotrophic factor and neuroprotectant [109]. In this study, the levels of BFGF ($P < 0.00001$) and VEGF ($P < 0.00001$) in the experimental group were significantly higher than those in the control group. These results suggest that ACU is helpful to enhance the neuroregulatory function of convalescent patients after apoplexy.

It is noteworthy that NIHSS, FMA, TC, TG, LDL, HDL, hs-CRP, HCT, and other indicators have high heterogeneity. In fact, there are many factors that affect heterogeneity, such as the quality of the included literature, gender, age, and geographic location. For instance, in the analysis of the NIHSS index, we can see that the proportion of females in Bian Yongghong 2017 is 46.24% but in Chen Rong 2015 is 27.5%. In the analysis of the FMA index, Jiang Ming 2018’s geographic location is in Shaanxi Province, but Fu Xiao-feng 2019 is in Zhejiang Province. These are all factors that lead to high heterogeneity of indicators.

The analysis of the relationship between drug and index network shows that Paoniae Radix Rubra, Angeticae Sinensis Radix, Astragali Radix, Phetetima, Carthami Flos, and Persicae Semen were the most common Chinese medicinal materials. These TCMs are also the prescription composition of Buyang Huanwu decocction (BYHWD), a famous traditional Chinese medicine, which has been utilized to promote the recovery of neurological function in intracerebral hemorrhage for centuries [110]. BYHWD was first described in a medicine book named “Yi Lin Gai Cuo” which was published in 1830 [14]. According to the literature of TCM, Buyang Huanwu decocction has the effect of promoting blood circulation and activating energy (qi) flow. It has been widely used in the clinical treatment and prevention of ischemic cardiocerebrovascular disease in China [111]. The “BYHWT” is comprised of seven natural materials: Astragali Radix, Angeticae Sinensis Radix, Paoniae Radix Rubra, Phetetima, Chuanxiong Rhizoma, Carthami Flos, and Persicae Semen [14]. The principle drug is Astragali Radix; multiuse can replenish the spleen and stomach, removing blood stasis. The minister drug is Angeticae Sinensis Radix, nourishing blood and promoting blood circulation. The assistant drugs are Paoniae Radix Rubra, Chuanxiong Rhizoma, Phetetima, Persicae Semen, and Carthami Flos. Phetetima has the effect of assisting other drugs to activate collaterals. Paoniae Radix Rubra, Chuanxiong Rhizoma, Persicae Semen, and Carthami Flos assist Angeticae Sinensis Radix to remove blood stasis [25]. A large number of studies have shown that BYHWD has a good effect in the treatment of acute cerebral infarction, which can improve the hemodynamic indexes and reduce the inflammatory factors in patients [87]. Puerariae Lobatae Radix, Salviae Mihiorrhizae Radix et Rhizoma, Bombyx Batrycticus, and Spatholobi Caulis are also the most common Chinese herbs. The main prescription group of Gegen Huang qi soup is Astragali Radix, Puerariae Lobatae Radix, Bombyx Batrycticus, cicada slough, and so on. Astragali Radix and Puerariae Lobatae Radix are principle drugs, which can invigorate qi and promote blood circulation [22]. Salviae Mihiorrhizae Radix et Rhizoma and Spatholobi Caulis are minister drugs, which can promote blood circulation and remove blood stasis.

ACU, one of the most popular TCM therapies, has been widely used in the clinical management of stroke [112]. In accordance with the WHO, stroke is one of the most recommended diseases to be treated by ACU [113]. The analysis of the relationship between ACU and index network shows that Baihui (GV20), Sanyinjiao (SP6), and Neiguan (PC6) have an obvious effect on the NIHSS. Baihui (GV20) is the meeting point between the Sanyang meridians of the hands and feet and the du meridian, which can be used for ameliorating infarct volume and neurological function score and exerting a potential neuroprotective role in experimental ischemic stroke [114]. Sanyinjiao (SP6) is the acupoint of Zusanyinjiao, which can improve the obstruction of qi and blood [45]. Neiguan (PC6) can reduce heart rate, suggesting a sympathoinhibitory effect [115]. ACU is helpful to regulate the immune function of convalescent patients after stroke. Renzhong (GV26), Zusani (ST36), Taiyang (EX-HN5), etc., have an obvious effect on serum immunoglobulin. Yanglingguan (GB34), Xuanzhong (GB39), Geshui (BL17), and so on play an important role in the ADL score. Yanglingguan (GB34) can relieve muscle spasm. Xuan Zhong (GB39) is an acupoint near the ankle joint, which can significantly inhibit local arthritis [116]. Geshui (BL17) has the effect of promoting blood circulation and removing blood stasis, dredging collaterals and relieving pain. Quchi, Waiguan, and so on have obvious influence on Barthel. Quchi (LI11) and Waiguan (TE5) can correct the imbalance.

### Table 11: Egger’s test.

| Indices                | Egger’s test | Z value | P value |
|------------------------|--------------|---------|---------|
| TER                    |              |         |         |
| Total                  | 1.4211       | 0.1553  |         |
| TCMs-TER               | 1.3117       | 0.1896  |         |
| ACU-TER                | 0.3884       | 0.6977  |         |
| OTTCM-TER              | 0.9818       | 0.3262  |         |
| BI                     |              |         |         |
| Total                  | 1.2143       | 0.2246  |         |
| TCMs-BI                | 0.4194       | 0.6749  |         |
| ACU-BI                 | -0.6821      | 0.4952  |         |
| OTTCM-BI               | 1.5219       | 0.1280  |         |
| NIHSS                  |              |         |         |
| Total                  | -2.3936      | 0.0167  |         |
| TCMs-NIHSS             | -0.4708      | 0.6378  |         |
| ACU-NIHSS              | -1.0771      | 0.2815  |         |
| OTTCM-NIHSS            | /            | /       |         |
| hs-CRP                 |              |         |         |
| TCMs-hs-CRP            | -2.5896      | 0.0096  |         |
between yin and yang. Hegu (LI4) and Huantiao (GB30) play an important role in the VEGF and BFGF indexes. Hegu (LI4) is the main treatment for mouth and eye oblique and apoplectic mouth shiver. Huantiao (GB30) can invigorate the spleen and replenish qi [80].

Moxibustion is a traditional Chinese method that makes use of the heat generated by burning herbal preparations containing Artemisia vulgaris (mugwort) to stimulate acupuncture points [117]. The procedure has been used for thousands of years in ancient Chinese medicine to restore balance following the belief that imbalance, for whatever reason, causes disorders or diseases [118]. The analysis of the relationship between OTTCM and index network shows that moxibustion plays an important role in FMA, MOCA, and NIHSS. Needle knife is a kind of therapeutic tool that combines ACU with a western scalpel. Its therapeutic effects include the stimulating effect of a needle on acupuncture points and the effect of a scalpel on cutting [58]. Needle knife can obviously improve CSI, Barthel, and other indexes. Scraping is one of the treasures of TCM and is widely used in the clinic. Scraping has the functions of soothing tendons and dredging collaterals, promoting blood circulation and removing blood stasis, improving microcirculation, promoting metabolism, and so on. Scraping can improve FMA and Barthel. Internal and external application combined with cupping has an obvious effect on the NIHSS score.

5. Conclusion

These findings indicate that the combination of TCM treatment and routine treatment significantly improves the TER after routine treatment. These effects are mediated by the combined action of several mechanisms. It is likely that the TCMs combined with routine treatment also affect the blood lipid by regulating the contents of TC, TG, LDL, and HDL. The combination could decrease the expression of thrombus regulatory factor and coagulation effect by decreasing the level of hs-CRP, FIB, and HCY in serum. In the present study, the combination of TCM treatment could enhance the protection of neural function and improve the activity of daily life by decreasing the NIHSS scoring while increasing the BI scoring. The ACU or OTTCM combined with routine treatment displays a motor coordination ability by increasing the level of FMA scoring. TCMs combined with routine treatment can reduce the level of hemorheology by decreasing the level of WHV, WLV, PV, and HCT in serum. In this study, the combination of ACU treatment can improve the immune level of patients by reducing IgG, IgA, and IgM. In this study, the OTTCM combined with routine treatment can enhance the cognitive function and improve the spasmodic state by decreasing CSI and MRS and increasing the MOCA score. The ACU combined with routine treatment can improve swallowing function and activity ability by reducing SSA and increasing the level of VFSS and ADL. The ACU combined with routine treatment plays a neuroprotective role by increasing the levels of BFGF and VEGF. Paeoniae Radix Rubra, Angeticae Sinensis Radix, Astragali Radix, Puerariae Lobatae Radix, and Salviae Miliorrihizae Radix et Rhizoma can effectively improve the clinical symptoms of stroke convalescent patients, promote the recovery of neurological function, and improve the ability of daily life. Acupuncture of Baihui (GV20), Sanyinning (SP6), Neiguan (PC6), Renzhong (GV26), Zusanli (ST36), and Taiyang (EX-HN5) can improve the clinical rehabilitation effect of patients and significantly improve the quality of life of patients. Moxibustion, needle knife, scraping, and other TCM therapy can significantly improve the indexes of stroke patients in the recovery period. However, our findings must be handled with care because of the small sample size and low quality of clinic trials cited. Other rigorous and large-scale RCTs are in need to confirm these results.

Abbreviations

| Abbreviation | Description |
|--------------|-------------|
| hs-CRP       | Hypersensitive C-reactive protein |
| HDL          | High-density lipoprotein |
| LDL          | Low-density lipoprotein |
| NIHSS        | National Institutes of Health Stroke Scale |
| RCTs         | Randomized controlled trials |
| TCM          | Traditional Chinese medicine |
| TER          | Total effective rate |
| TC           | Total cholesterol |
| TG           | Triglyceride |
| WHV          | Whole high viscosity |
| WLV          | Whole low viscosity |

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors’ Contributions

XZ, Y-GC, and Z-CW searched articles in electronic databases and wrote the manuscript. LW, X-FZ, and D-YG analyzed the data. J-MZ, J-XC, and L-SP performed data extraction. J-BZ and Y-JS designed the study and amended the paper. Xue Zhang, Xiao-Fei Zhang, and Lin Wang contributed equally to this work.

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Supplementary Materials

International coding of acupoints and GRADE evidence profile. (Supplementary Materials)

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