



# Would integrated Western and traditional Chinese medicine have more benefits for stroke rehabilitation? A systematic review and meta-analysis

Linda LD Zhong <sup>1</sup>, Ya Zheng,<sup>1</sup> Alexander Y Lau,<sup>2</sup> Norman Wong,<sup>1</sup> Liang Yao,<sup>3</sup> Xingyao Wu,<sup>1</sup> Tengting Shao,<sup>4</sup> Zhenxing Lu,<sup>5</sup> Huijuan Li,<sup>6</sup> Chun Sum Yuen,<sup>7</sup> Jianwen Guo,<sup>8</sup> Suzanne Lo,<sup>9</sup> Janita Chau <sup>9</sup>, Kam Wa Chan,<sup>10</sup> Bacon Fung Leung Ng,<sup>11</sup> Zhaoxiang Bian,<sup>1</sup> Edwin Chau-leung Yu<sup>12</sup>

**To cite:** Zhong LLD, Zheng Y, Lau AY, et al. Would integrated Western and traditional Chinese medicine have more benefits for stroke rehabilitation? A systematic review and meta-analysis. *Stroke & Vascular Neurology* 2022;7:e000781. doi:10.1136/svn-2020-000781

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/svn-2020-000781>).

LLZ and YZ are joint first authors.

Received 8 December 2020

Accepted 2 August 2021

Published Online First

26 August 2021



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

## Correspondence to

Dr Linda LD Zhong;  
ldzhong@hkbu.edu.hk

Dr. Alexander Y Lau;  
alexlau@cuhk.edu.hk

## ABSTRACT

**Background** Stroke is a major cause of death or long-term disability worldwide. Many patients with stroke receive integrative therapy consisting of Western medicine (WM) and routine rehabilitation in conjunction with Chinese medicine (CM), such as acupuncture and Chinese herbal medicine. However, there is no available evidence on the effectiveness of the combined use of WM and CM interventions in stroke rehabilitation.

**Aims** The purpose of this meta-analysis is to evaluate the results of all individual studies to assess the combined use of CM and WM in stroke rehabilitation compared with WM only.

**Methods** The Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines were followed. MEDLINE, EMBASE, Cochrane and China National Knowledge Infrastructure (CNKI) were searched. The included outcomes were dependency, motor function, depression and swallowing function. Subgroup analysis was performed, and publication bias was assessed using funnel plots.

**Summary of review** 58 studies and 6339 patients were included in the meta-analysis. Subgroup analysis revealed that combined therapy comprising both acupuncture and WM had a superior effect on improving dependency and swallowing function compared with standard WM therapy alone. Potential superiority of combined therapy comprising CM and WM in improving depression compared with standard WM therapy was also found.

**Conclusions** Our results indicate that the combined use of CM and WM could be more efficacious in stroke rehabilitation compared with the use of WM therapy alone. However, most studies were short in duration (2 to 4 weeks) and prone to different types of biases, which prevents making any conclusion regarding the long-term effects and raises concerns regarding true efficacy in context of high likelihood of Hawthorn bias. So, more randomised controlled trials with more rigorous design and longer duration of treatment and follow-up need to be conducted to compare WM alone versus WM and CM combined.

**PROSPERO registration number** CRD42020152050.

## INTRODUCTION

In China, many patients with stroke receive integrative medicine, which include treatment

by Western medicine (WM) and routine rehabilitation in conjunction with acupuncture and/or Chinese medicine (CM).<sup>1,2</sup> The CM-based rehabilitation is characterised by holistic concepts with multiple therapeutic approaches, mostly comprising acupuncture and herbal medicine.<sup>3,4</sup> Chinese herbal medicine (CHM) has multifactorial effects, which include antioxidant, anti-inflammatory antipaprotic, neuroprotective and vascular protective properties, and it is believed to be efficacious in stroke treatment.<sup>5</sup> Regarding acupuncture, available evidence suggests that it may have beneficial effects on improving dependency, global neurological deficiency and some specific neurological impairments in people with stroke in the convalescent stage as well as no obvious adverse events.<sup>6,7</sup>

Despite clinical studies suggesting that integrative medicine is effective in stroke rehabilitation with regards to improving dependency, motor function, depression and swallowing function, the evidence generally is low in quality.<sup>8–11</sup> A systematic review to estimate the efficacy of integrative medicine and summarise the overall quality of existing clinical studies is, therefore, essential to gain insight and posit a framework for the development of integrated clinical services. As such, the purpose of this systematic review is to summarise the results of all clinical trials using combined WM and CM interventions in terms of improvements in the outcomes of dependency, motor function, depression and swallowing function during stroke rehabilitation.

## METHODS

This systematic review with meta-analysis was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines.<sup>12</sup> The study

protocol was registered at PROSPERO prior to the start of the review ([https://www.crd.york.ac.uk/prospero/display\\_record.php?RecordID=152050](https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=152050)).

### Search strategy

We searched MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL) and the China National Knowledge Infrastructure (CNKI) from inception to January 2021 using medical subject headings and text words related to stroke rehabilitation. We referred to the published Cochrane protocol about CM and stroke rehabilitation to initiate our search strategies.<sup>13–15</sup> The detailed search strategy used is described in online supplemental table 1.

### Selection criteria

We included randomised controlled trials (RCTs) and quasi-RCTs on stroke rehabilitation that compared WM and CM interventions (mainly CHM, acupuncture, Tuina and Moxibustion) with at least one control group only using WM practice. In the quasi-RCTs, participants were allocated to different arms of the trial using a method of allocation that was not completely random, such as admission sequence. Both parallel groups and crossover designs were included. The main stroke types included were ischaemic stroke and haemorrhagic stroke. Trials involving participants of any age or sex during poststroke rehabilitation (14 days since onset) were included.

The included outcomes were dependency, motor function, depression and swallowing function. For the assessment of dependency, the Barthel Index, Modified Barthel Index, activities of daily living and Comprehensive Functional Assessment were included. Regarding motor function, the Fugl-Meyer Assessment, Brunnstrom recovery stages score and motor evoked potential were included. The included assessments to evaluate improvement in depression were the Hamilton depression rating scale, Hamilton anxiety rating scale, Symptoms of Traditional Chinese Medicine depression scale and 10-item Center for Epidemiological Studies Depression Scale. Swallowing function was measured by the water drinking test, standardised swallowing assessment and repetitive saliva-swallowing test.

We excluded case-control, cohort and cross-sectional studies and studies with sample size of less than 50 participants.

### Data extraction and outcomes

A first screening was performed by seven independent screening reviewers based on the titles and abstracts of all articles found by the database searches (after removal of duplicates). Some obviously irrelevant studies, such as non-clinical trials, animal studies and those without poststroke rehabilitation outcomes, were excluded. Any discordance was resolved by discussion among all seven reviewers. After the first screening, preliminary included articles were screened based on their full texts by two reviewers (YZ and LLDZ). They were further assessed

according to our inclusion and exclusion criteria, and the eligible studies were included in the meta-analysis. The other authors, NW, XW, and TS, conducted literature search and synthesised the data. ZL and HL extracted the data and produced the figures. Rayyan was used for gathering all papers, removing duplicates and performing article screening.<sup>16</sup> Information was extracted from each included study regarding the study design, sample size, condition, characteristics of included participants, type of intervention (including type, dose, duration and frequency of treatment in various intervention groups) and outcomes.

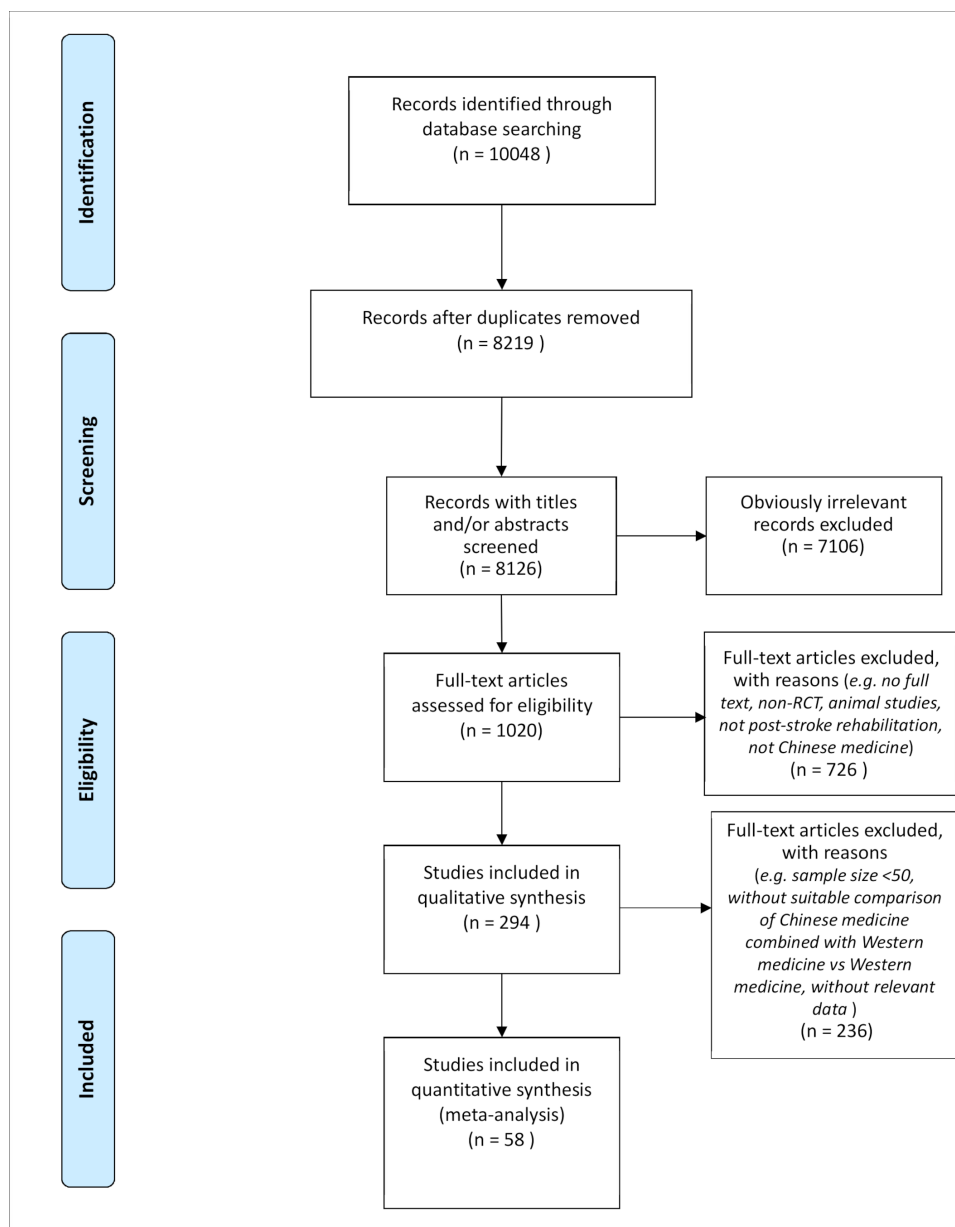
### Risk of bias assessment

To ascertain the validity of eligible randomised trials, two review authors (NW and LY) assessed potential risks of bias independently for all included studies using the Cochrane's tool for assessing risk of bias.<sup>17</sup> They assessed all six domains (sequence generation; allocation concealment; blinding of participants, personnel and outcome assessors; incomplete outcome data; selective outcome reporting and other sources of bias) for each study and assigned a score (high, low or unclear) depending on their own respective judgement. The criteria used for assessing the risk of bias are shown in the online supplemental. We contacted the study authors for clarification if necessary in cases of potential risks of bias.

### Statistical synthesis and analysis

For continuous outcomes, considering the various scales used, we used both standard mean difference (SMD) and weighted mean differences with 95% CI. RevMan V.5.3 software offered by Cochrane collaboration was used for all data analyses. Forest plots were generated to visually assess the effect sizes and corresponding 95% CIs using random effects models. We conducted a subgroup analysis of short-term duration ( $\leq 1$  month) versus longer term duration ( $> 1$  month), hypothesising a larger effect in the short-term group.  $P < 0.05$  was considered as significant for the subgroup effect.

Funnel plots were adopted to assess the possibility of publication bias. The tools were applied only when at least 10 studies reported the patient important outcomes, since the power of the tests would be too low to distinguish chance from real asymmetry for fewer studies.<sup>17</sup> The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach was used to assess the quality of the findings of outcomes.<sup>18</sup> Certainty of evidence was divided into four levels: high quality: further research is very unlikely to change our confidence in the estimate of effect; moderate quality: further research is unlikely to have an important impact on our confidence in the estimate of effect and may change the estimate; low quality: further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate and very low quality: we are very uncertain about the estimate.<sup>19</sup>



**Figure 1** Flow diagram of study selection. RCT, randomised controlled trial.

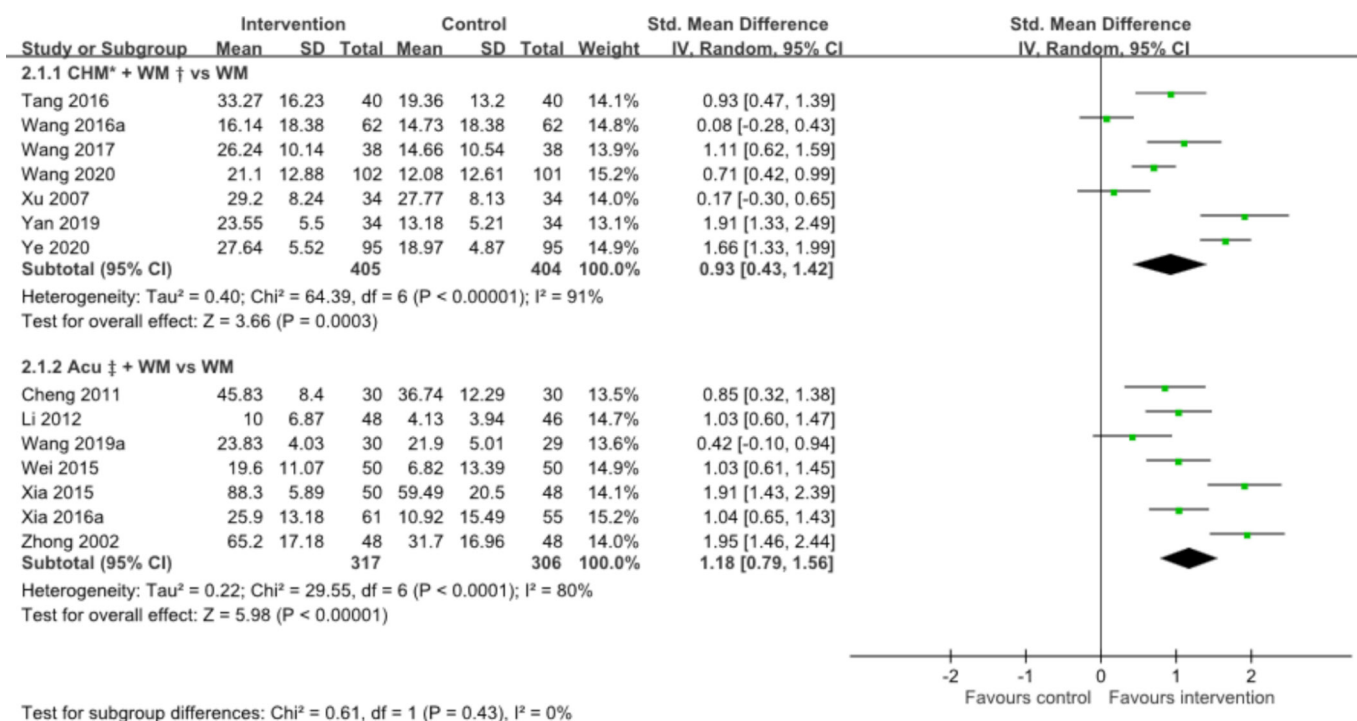
## RESULTS

### Study characteristics

We screened the titles and/or abstracts of 8126 studies and excluded 7106 irrelevant studies. We then screened full texts of the remaining 1020 studies and excluded 726 studies that did not have full texts, covered animal research or did not cover RCTs, poststroke rehabilitation or CM. Finally, 294 studies were included in the qualitative synthesis. Among them, 236 studies were excluded as their sample size was less than 50, and they did not contain a suitable comparison of CM combined with WM versus only WM or relevant data. As such, 58 studies with 6339 patients in total were included in the meta-analysis. The detailed flow diagram is included in [figure 1](#).

The 58 included studies consisted of 7 quasi-RCTs and 51 RCTs. Among these studies, 14 reported the usage of

a blinding method and 9 reported having a follow-up period after treatment. Moreover, 39 studies compared WM and acupuncture with WM, 14 studies compared WM and CHM with WM and 5 studies compared WM and other CM interventions (eg, Tuina, Moxibustion etc) with WM. Among the 58 studies, the 10 most commonly used CM herbs were Astragali Radix (*Huangqi*), Chuanxiong Rhizoma (*Chuanxiong*), Bupleuri Radix (*Chaihu*), Curcumae Radix (*Yujin*), Angelicae Sinensis Radix (*Danggui*), Poria (*Fuling*), Cinnamomi Ramulus (*Guizhi*), Pheretima (*Dilong*), Paeoniae Radix Alba (*Baishao*), and Pinelliae Rhizoma (*Banxia*). In addition, the 10 most commonly used acupoints were Hegu (*LI 4*), Baihui (*DU 20*), Neiguan (*PC 6*), Zusanli (*ST 36*), Fengchi (*GB 20*), Lianquan (*RN 23*), Sanyinjiao (*SP 6*), Waiguan (*SJ 5*), Yanglingquan (*GB 34*) and Quchi (*LI 11*). Details of these



\*CHM: Chinese Herbal Medicine; †WM: Western Medicine; ‡Acu: Acupuncture.

\*\* The reference for each study have been listed in Supplement Table 2 and 'List of included studies' references'.

**Figure 2** The improvement of integrated medicine compared with western medicine only in dependency.

are shown in the characteristics table in online supplemental table 2.

The meta-analysis results of each assessment are shown in online supplemental figures 1–4. The funnel plots of the outcomes and details about the risks of bias are shown in online supplemental figures 5–8 and online supplemental figures 13 and 14. The subgroup analysis includes studies comparing the efficiency of the combined use of WM with either CHM or Acupuncture versus the use of WM only. The results of each assessment were pooled based on their categories of outcomes and reported as SMDs and 95% CIs in figures 2–5. And the GRADE summary of outcomes in the subgroup analysis is displayed in table 1. Furthermore, another subgroup analysis based on the duration of treatment is shown in table 2.

#### Improvement in dependency

We stratified the included studies according to subgroups as shown in figure 2. Both subgroups showed the superiority of combined treatment compared with WM therapy only in the improvement of dependency. Seven RCTs displayed the superiority of the effect of CHM and WM combined therapy compared with WM therapy only (809 patients; SMD 0.93, 95% CI 0.43 to 1.42;  $I^2=91\%$ ). Six RCTs and one quasi-RCT displayed the superiority of the effect of acupuncture and WM combined therapy compared with standard WM therapy only (623 patients;

SMD 1.18, 95% CI 0.79 to 1.56;  $I^2=80\%$ , low quality, figure 2 and table 1).

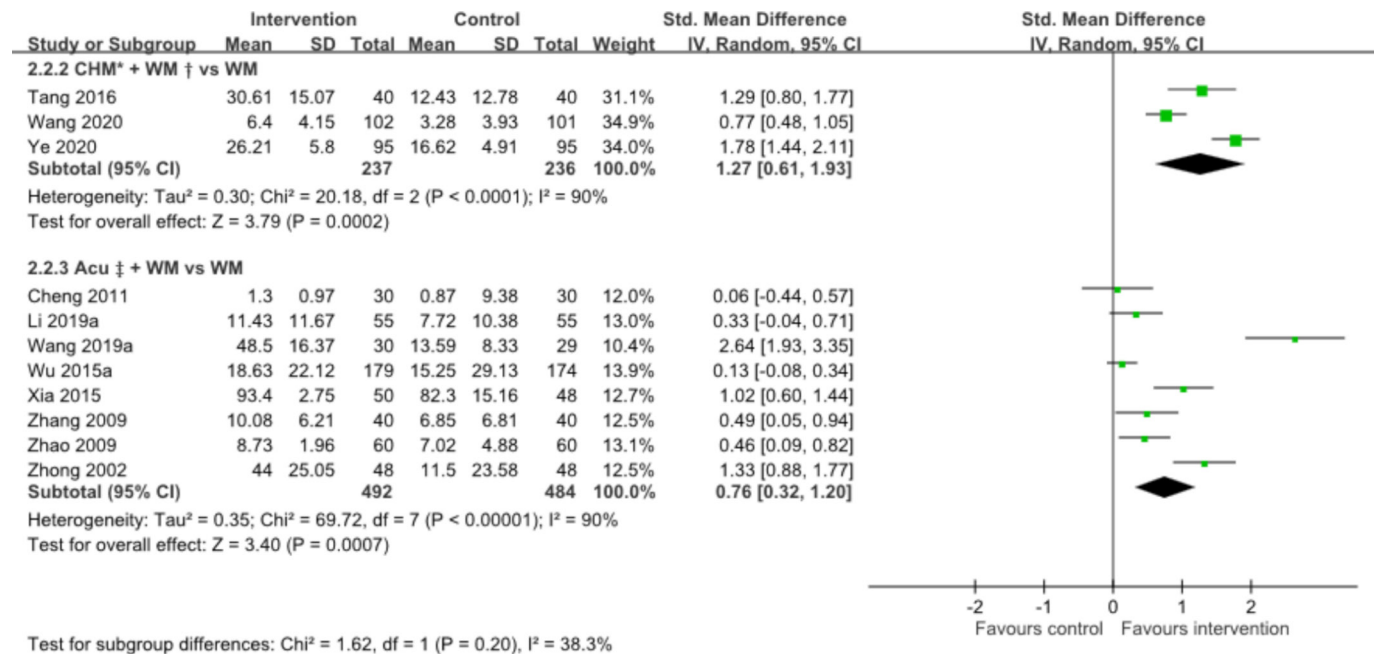
#### Improvement in motor function

Subgroup analysis on the improvement of motor function was performed. We stratified the included studies according to subgroups as shown in figure 3. Both subgroups showed the superiority of combined treatment compared with baseline WM therapy in the improvement of motor function. Three RCTs showed the superiority of the effect of CHM and WM combined therapy compared with baseline WM therapy (473 patients; SMD 1.27, 95% CI 0.61 to 1.93;  $I^2=90\%$ , low certainty, figure 3 and table 1). Seven RCTs and one quasi-RCT showed the superiority of the effect of acupuncture and WM combined therapy compared with baseline WM therapy (976 patients; SMD 0.76, 95% CI 0.32 to 1.20;  $I^2=90\%$ , low certainty, figure 3 and table 1).

#### Improvement in depression

Subgroup analysis on the improvement of depression was performed. We stratified the included studies according to subgroups as shown in figure 4. Both subgroups showed the superiority of combined treatment compared with baseline WM therapy in the improvement of depression. Six RCTs and one quasi-RCT demonstrated the superiority of the effect of CHM and WM combined therapy compared with baseline WM therapy (641 patients; SMD

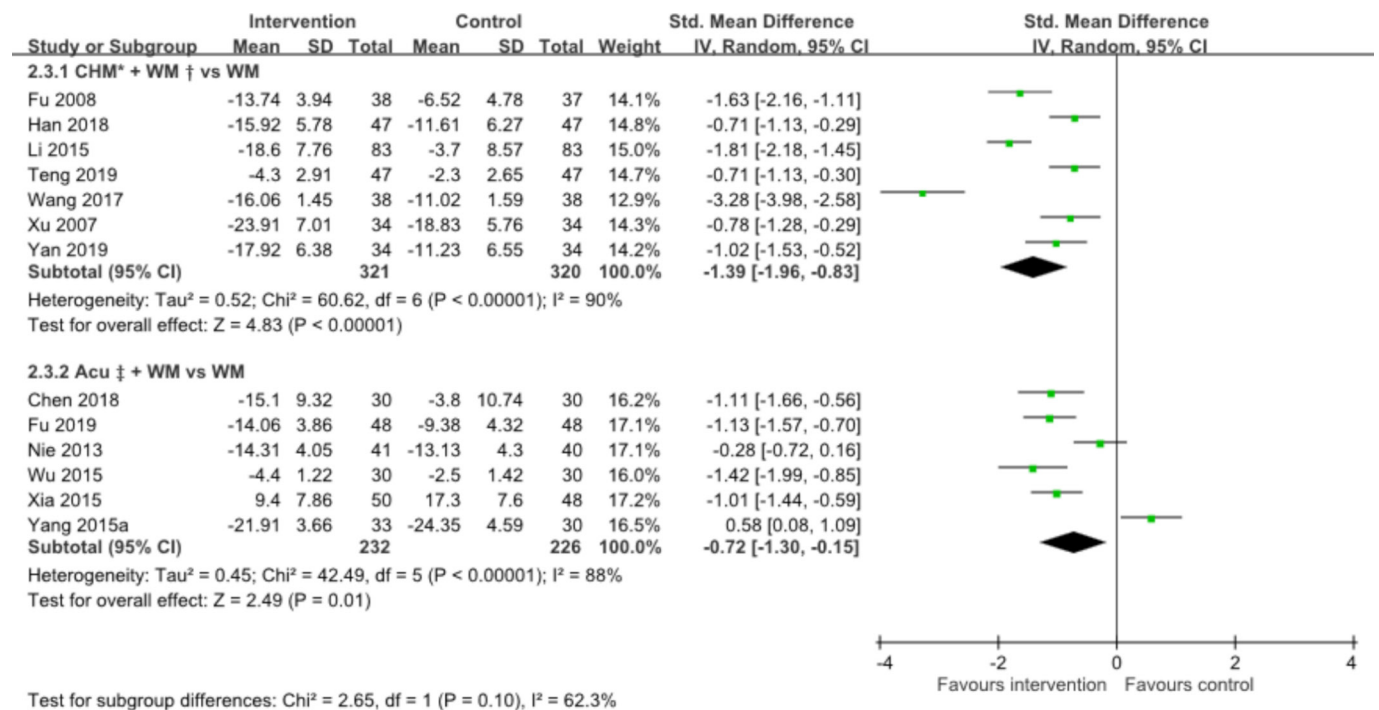




\*CHM: Chinese Herbal Medicine; †WM: Western Medicine; ‡Acu: Acupuncture.

\*\* The reference for each study have been listed in Supplement Table 2 and 'List of included studies' references'.

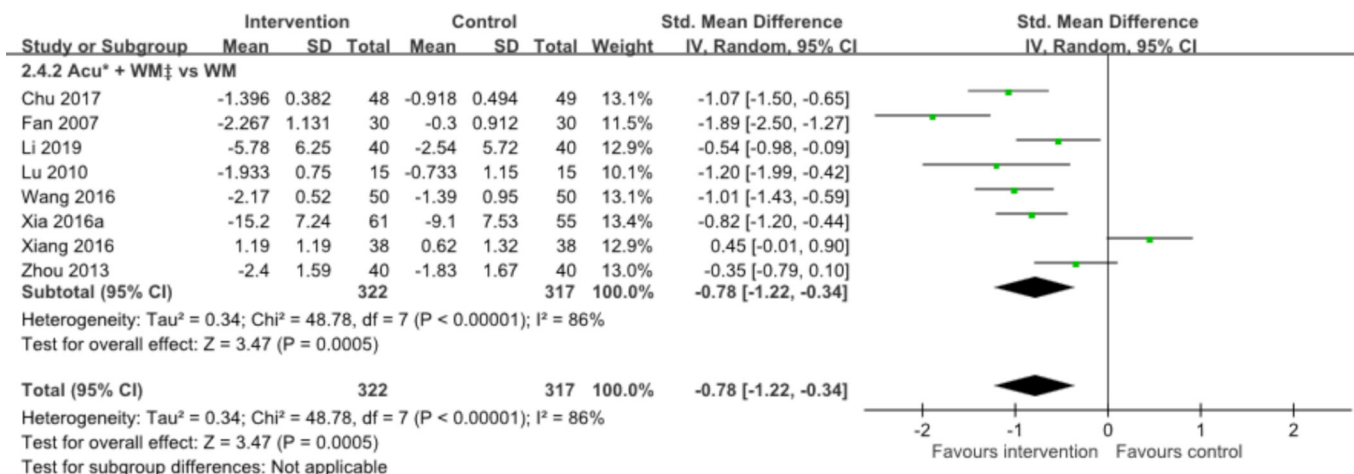
**Figure 3** The improvement of integrated medicine compared with western medicine only in motor function.



\*CHM: Chinese Herbal Medicine; †WM: Western Medicine; ‡Acu: Acupuncture.

\*\* The reference for each study have been listed in Supplement Table 2 and 'List of included studies' references'.

**Figure 4** The improvement of integrated medicine compared with western medicine only in depression.



\*Acu: Acupuncture; †WM: Western Medicine.

\*\* The reference for each study have been listed in Supplement Table 2 and 'List of included studies' references'.

**Figure 5** The improvement of integrated medicine compared with western medicine only in swallowing function.

-1.39, 95% CI -1.96 to -0.83; I<sup>2</sup>=90%, low certainty, figure 4 and table 1). Six trials demonstrated the superiority of the effect of acupuncture and WM combined

therapy compared with baseline WM therapy (458 patients; SMD -0.72, 95% CI -1.30 to -0.15; I<sup>2</sup>=88%, low certainty, figure 4 and table 1).

**Table 1** GRADE† summary of findings of outcomes

Outcomes	Effects 95% CI*	Certainty of the evidence†	Interpretations
Improvement in dependency (CHM+WM vs WM)	SMD 0.93 95% CI (0.43 to 1.42). Based on data from 809 patients in seven studies	Low (serious risk of bias, inconsistency)	CHM+WM may improve dependency
Improvement in dependency (Acu†+WM vs. WM)	SMD 1.18 95% CI (0.79 to 1.56). Based on data from 623 patients in seven studies	Low (serious risk of bias, inconsistency)	Acu +WM may improve dependency
Improvement in motor function (CHM+WM vs. WM)	SMD 1.27 95% CI (0.61 to 1.93). Based on data from 473 patients in three studies	Low (serious risk of bias, inconsistency)	CHM+WM may improve motor function
Improvement in motor function (Acu +WM vs. WM)	SMD 0.76 95% CI (0.32 to 1.2). Based on data from 976 patients in eight studies	Low (serious risk of bias, inconsistency)	Acu +WM may improve motor function.
Improvement in depression (CHM+WM vs. WM)	SMD -1.39 95% CI (-1.96 to 0.83). Based on data from 641 patients in seven studies	Low (serious risk of bias, inconsistency)	CM+WM may improve depression.
Improvement in depression (Acu +WM vs. WM)	SMD -0.72 95% CI (-1.30 to 0.15). Based on data from 458 patients in six studies	Low (serious risk of bias, inconsistency)	Acu +WM may improve depression.
Improvement in swallowing function (Acu +WM vs. WM)	SMD -0.78 95% CI (-1.22 to 0.34). Based on data from 639 patients in eight studies	Low (serious risk of bias, inconsistency)	Acu +WM may improve swallowing function.

\*SMD=0.2, 0.5, 0.8 were considered as small effect, moderate effect and large effect, respectively.

†The certainty of evidence is divided into three levels: high quality: further research is very unlikely to change our confidence in the estimate of effect; moderate quality: further research is unlikely to have an important impact on our confidence in the estimate of effect and may change the estimate; low quality: further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate; very low quality: we are very uncertain about the estimate.

‡GRADE: The Grading of Recommendations Assessment, Development and Evaluation working group.

Acu, acupuncture; CHM, Chinese Herbal Medicine; SMD, standard mean difference; WM, western medicine.

**Table 2** Subgroup analysis on the duration of treatment

Subgroup analysis	Number of studies (number of patients)	SMD, 95% CI	P interaction
Improvement in dependency			
Short duration ( $\leq 1$ month)	17 (1980)	0.92 (0.58 to 1.26)	0.43
Longer term duration ( $>1$ month)	10 (781)	1.12 (0.75 to 1.5)	
Improvement in motor function			
Short duration ( $\leq 1$ month)	20 (2541)	0.71 (0.40 to 1.02)	0.66
Longer term duration ( $>1$ month)	6 (558)	0.85 (0.33 to 1.36)	
Improvement in depression			
Short duration ( $\leq 1$ month)	9 (809)	-1.19 (-1.62 to -0.76)	0.23
Longer term duration ( $>1$ month)	6 (466)	-0.76 (-1.31 to -0.21)	
Improvement in swallowing function			
Short duration ( $\leq 1$ month)	10 (801)	-0.66 (-1.02 to -0.30)	0.60
Longer term duration ( $>1$ month)	3 (273)	-0.53 (-0.86 to -0.20)	

SMD, standard mean difference.

### Improvement in swallowing function

Six RCTs and two quasi-RCTs demonstrated the superiority of the effect of acupuncture and WM combined therapy compared with baseline WM therapy (639 patients; SMD -0.78, 95% CI -1.22 to -0.34;  $I^2=86\%$ , low quality, [figure 5](#) and [table 1](#)). There were no studies in the subgroups that compared the effect of CHM and WM combined therapy with baseline WM therapy in the improvement of swallowing function.

### Subgroup analysis

A subgroup analysis was conducted based on short-term treatment duration ( $\leq 1$  month) versus longer term treatment duration ( $>1$  month) for all outcomes. The results indicate no subgroup effects in all outcomes. The details are shown in [table 2](#) and online supplemental figures 9–12.

### DISCUSSION

Overall, the systematic review provided evidence that the combined use of CHM or acupuncture with WM might have more benefits than WM therapy alone in stroke rehabilitation. However, these results should be interpreted cautiously given some concerns associated with potential publication bias and low quality of several original studies, randomisation in allocation and the short duration of the treatment periods. Subgroup analysis suggested that acupuncture combined with WM may be more efficacious together than alone in different outcomes. Our results also indicate that acupuncture combined with WM has a stronger effect than CHM combined with WM and has the potential for more extensive use in stroke rehabilitation.

Despite there are existing systematic reviews on the effect of CHM and acupuncture in managing stroke, our review offers various new perspectives. First, regarding our methodology, we only included

papers of RCTs and quasi-RCTs with a sample size of 50 or more. Stricter inclusion criteria could increase the quality of evidence and reduce the risk of bias. Second, we focused on evaluating outcomes related to stroke rehabilitation that have not been thoroughly discussed previously. For instance, efficacy in improving swallowing and poststroke depression have not been analysed in existing reviews.<sup>4 20</sup> These complications are known to affect the quality of life of poststroke patients, particularly swallowing function, which increases the rate of institutionalisation and mortality.<sup>21 22</sup> Third, we reported on subgroup analysis based on the treatment characteristics of CHM versus acupuncture. Such joint comparisons between CHM and acupuncture have not previously been attempted. Additionally, we indicated the most commonly used acupuncture points and herbs in our analysis and listed them in our baseline characteristic table (online supplemental table 2).

Our results hint that CHM and acupuncture combined with WM may be more efficacious than WM alone in terms of some aspects, which may need further investigation using RCTs. Combined WM therapy with CHM appears to be better for improving depression than combined WM therapy with acupuncture. Combined WM treatment with acupuncture instead has a greater effect on improving dependency and motor function than that with CHM. However, it is known that patients with depression are sensitive to psychological stimuli and their motor function and dependency are affected by positive motivation. As acupuncture positively impacts both of these aspects, we may also need to consider all these effects. Thus, the results from our subgroup analysis require further confirmation through direct comparisons between CHM and acupuncture, either using statistical models such as network meta-analysis or future clinical trials. Such evidence would be very valuable to medical providers in



choosing the best therapy to improve different outcomes of patients with stroke.

This systematic review has several limitations. The first major limitation is the quality of the included studies. Regarding selection bias, 36 included studies had low risk of bias, 15 had unclear risk of bias and 7 had high risk of bias. This may lead to an inaccurate conclusion on the effects of CHM and acupuncture. Second, some of the effects observed in our study may be a result of publication bias, and most included studies exhibited reporting bias. The resulting asymmetrical funnel plots in the improvement of motor function and improvement of swallowing function measured by water drinking test suggest an overestimation of effect sizes in some of the included trials due to selective reporting. Third, heterogeneity among the studies was relatively high, which may affect the quality of results generated by meta-analysis. Fourth, there was a lack of a placebo control in the included studies as the intervention designs were predominantly CHM or acupuncture plus WM in the treatment groups versus WM only in the control groups. These designs could not negate any placebo effects produced by CHM or acupuncture, which may have potentially induced an overestimation of the treatment effect in these studies. Finally, we did not conduct subgroup analyses on different ages, genders and severities in our outcome assessment.

## CONCLUSIONS

The combined use of CM and WM may have positive effects in stroke rehabilitation compared with the use of WM therapy alone. This study will guide the enhancement of rigour and reduction of bias in future clinical trials to better validate the effects of CM and acupuncture. Further studies with longer durations of treatment and follow-ups should be conducted with more rigorous designs.

## Author affiliations

<sup>1</sup>Hong Kong Chinese Medicine Clinical Study Centre, School of Chinese Medicine, Hong Kong Baptist University, Hong Kong SAR, China

<sup>2</sup>Department of Medicine and Therapeutics and Hong Kong Institute of Integrative Medicine, Prince of Wales Hospital, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China

<sup>3</sup>Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, Ontario, Canada

<sup>4</sup>Clinical Laboratory, Shanghai Traditional Chinese Medicine Integrated Institute of Vascular Abnormalities, Shanghai, China

<sup>5</sup>Institute of Medical Research, Northwestern Polytechnical University, Xi'an, Shanxi, China

<sup>6</sup>Evidence Based Medicine Center, School of Basic Medical Sciences, Lanzhou University, Lanzhou, China

<sup>7</sup>School of Chinese medicine, Hong Kong Baptist University, Hong Kong SAR, China

<sup>8</sup>Brain Center, Guangdong Provincial Hospital of Traditional Chinese Medicine, Guangdong University of Chinese Medicine, Guangzhou, China

<sup>9</sup>The Nethersole School of Nursing, Faculty of Medicine, the Chinese University of Hong Kong, Hong Kong SAR, China

<sup>10</sup>Department of Medicine, Li Ka Shing Faculty of Medicine, the University of Hong Kong, Hong Kong SAR, China

<sup>11</sup>Department of Rehabilitation Sciences, Hong Kong Polytechnic University, Hong Kong SAR, China

<sup>12</sup>Hong Kong Association for Integration of Chinese-Western Medicine Limited, Hong Kong SAR, China

**Contributors** LLDZ and YZ screened all articles and drafted the manuscript. They contributed equally and could be considered as co-first authors. NW, XW, TS conducted the literature searching and synthesised the data. ZL, HL extracted the data and manufactured the figures. NW and LY worked independently and assessed potential risks of bias for all included studies using the Cochrane's tool for assessing risk of bias and they also help to make the tables. CSY and JG contributed to revise the manuscript. AL, EGY designed the research plan and gave supervision. SL, JC, KWC, BFLN, ZB contributed to monitor the research and give critical comments and finalised the manuscript.

**Funding** This study was funded by Innovative Technology Commission of the government of Hong Kong SAR (GSP/008/18).

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

## ORCID iDs

Linda LD Zhong <http://orcid.org/0000-0002-3877-1914>

Janita Chau <http://orcid.org/0000-0002-3750-7396>

## REFERENCES

- Fang J, Chen L, Chen L, *et al.* Integrative medicine for subacute stroke rehabilitation: a study protocol for a multicentre, randomised, controlled trial. *BMJ Open* 2014;4:e007080.
- Wang J, Xiong X. Current situation and perspectives of clinical study in integrative medicine in China. *Evid Based Complement Alternat Med* 2012;2012:1–11.
- Tang J-L, Liu B-Y, Ma K-W. Traditional Chinese medicine. *Lancet* 2008;372:1938–40.
- Junhua Z, Menniti-Ippolito F, Xiumei G, *et al.* Complex traditional Chinese medicine for poststroke motor dysfunction: a systematic review. *Stroke* 2009;40:2797–804.
- Gaire BP. Herbal medicine in ischemic stroke: challenges and prospective. *Chin J Integr Med* 2018;24:243–6.
- Yang A, HM W, Tang JL. Acupuncture for stroke rehabilitation. *Cochrane Database Syst Rev* 2016;2016:CD004131.
- Hung CY-F, Wu X-Y, Chung VC-H, *et al.* Overview of systematic reviews with meta-analyses on acupuncture in post-stroke cognitive impairment and depression management. *Integr Med Res* 2019;8:145–59.
- Xu M, Li D, Zhang S. Acupuncture for acute stroke. *Cochrane Database Syst Rev* 2018;3:CD003317.
- Moher D, Liberati A, Tetzlaff J, *et al.* Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ* 2009;339:b2535.
- Wang H-L, Zeng H, Xu M-B, *et al.* Efficacy and safety of Chinese herbal medicine for primary intracerebral hemorrhage: a systematic review of randomized controlled trials. *Front Pharmacol* 2019;10:1139.
- Cai W, Mueller C, Li Y-J, *et al.* Post stroke depression and risk of stroke recurrence and mortality: a systematic review and meta-analysis. *Ageing Res Rev* 2019;50:102–9.
- Huang J, Shi Y, Qin X, *et al.* Clinical effects and safety of electroacupuncture for the treatment of poststroke dysphagia: a comprehensive systematic review and meta-analysis. *Evid Based Complement Alternat Med* 2020;2020:1–9.
- Lee MS, Shin B-C, Kim J-I, Lee JA, Kim TH, *et al.* Moxibustion for stroke rehabilitation: systematic review. *Stroke* 2010;41:817–20.
- Zhang HW, Zheng R, Xu C. Tai chi for improving recovery after stroke. *Cochrane Database Syst Rev* 2018;3:CD010207.
- Abdul Rani AA, Ab Ghani RM, Shamsuddin S. Massage therapy for improving functional activity after stroke. *Cochrane Database Syst Rev* 2015;10:CD011924.
- Ouzzani M, Hammady H, Fedorowicz Z, *et al.* Rayyan-a web and mobile APP for systematic reviews. *Syst Rev* 2016;5:210.



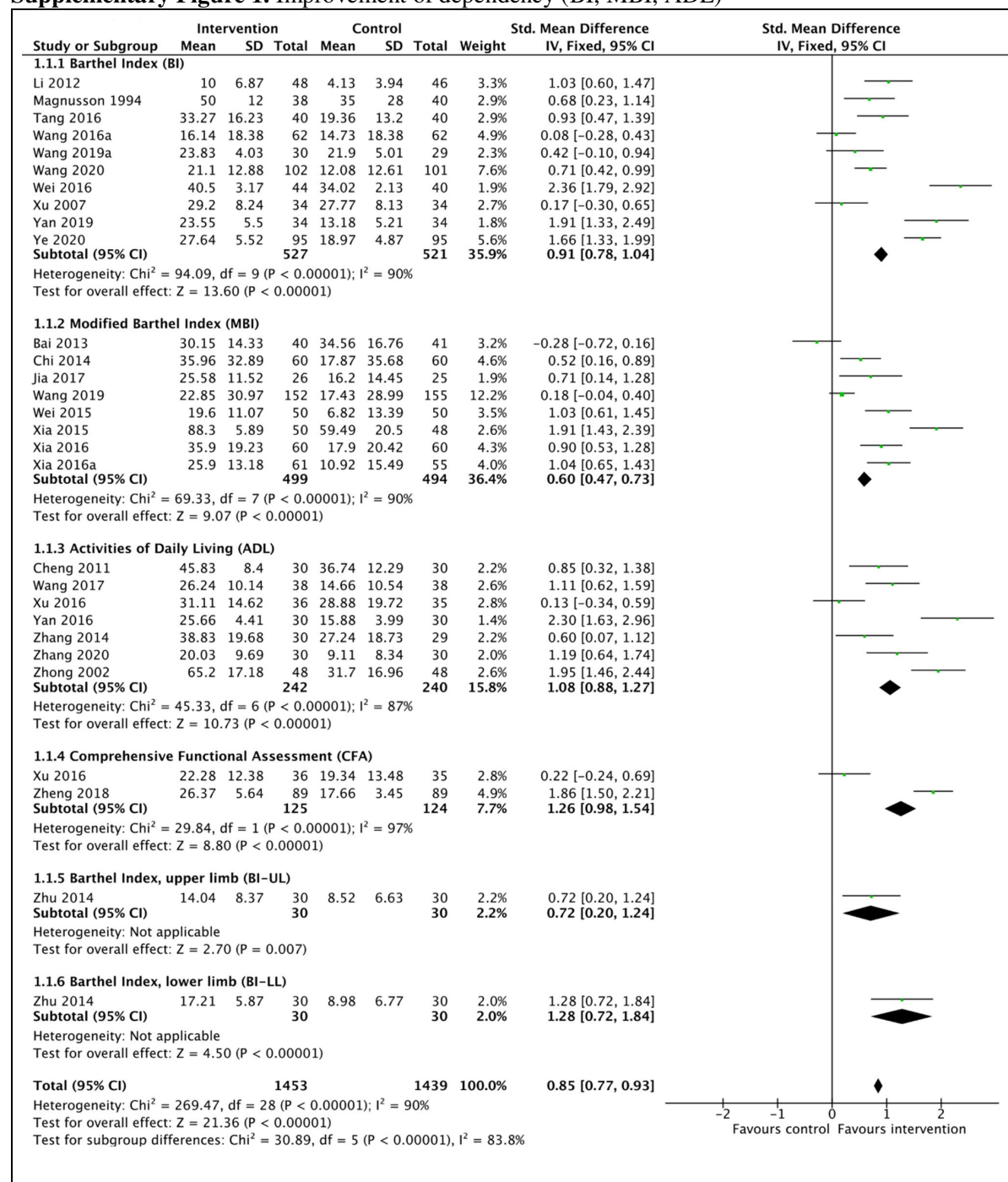
- 17 Shuster JJ. Review: cochrane Handbook for systematic reviews for interventions, version 5.1.0, published 3/2011. Julian P.T. Higgins and Sally green, editors. *Res Synth Methods* 2011;2:126–30.
- 18 Xin Z, Xue-Ting L, De-Ying K. Grade in systematic reviews of acupuncture for stroke rehabilitation: recommendations based on high-quality evidence. *Sci Rep* 2015;5:16582.
- 19 Guyatt GH, Oxman AD, Vist GE, *et al.* Grade: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ* 2008;336:924–6.
- 20 Wu B, Liu M, Liu H, *et al.* Meta-Analysis of traditional Chinese patent medicine for ischemic stroke. *Stroke* 2007;38:1973–9.
- 21 Arnold M, Liesirova K, Broeg-Morway A, *et al.* Dysphagia in acute stroke: incidence, burden and impact on clinical outcome. *PLoS One* 2016;11:e0148424.
- 22 Beharry A, Michel P, Faouzi M, *et al.* Predictive factors of swallowing disorders and bronchopneumonia in acute ischemic stroke. *J Stroke Cerebrovasc Dis* 2019;28:2148–54.

# Supplementary Material

## **Would Integrated Western and Traditional Chinese Medicine Have More Benefits for Stroke Rehabilitation? – A Systematic Review and Meta-analysis**

# Supplementary Figures

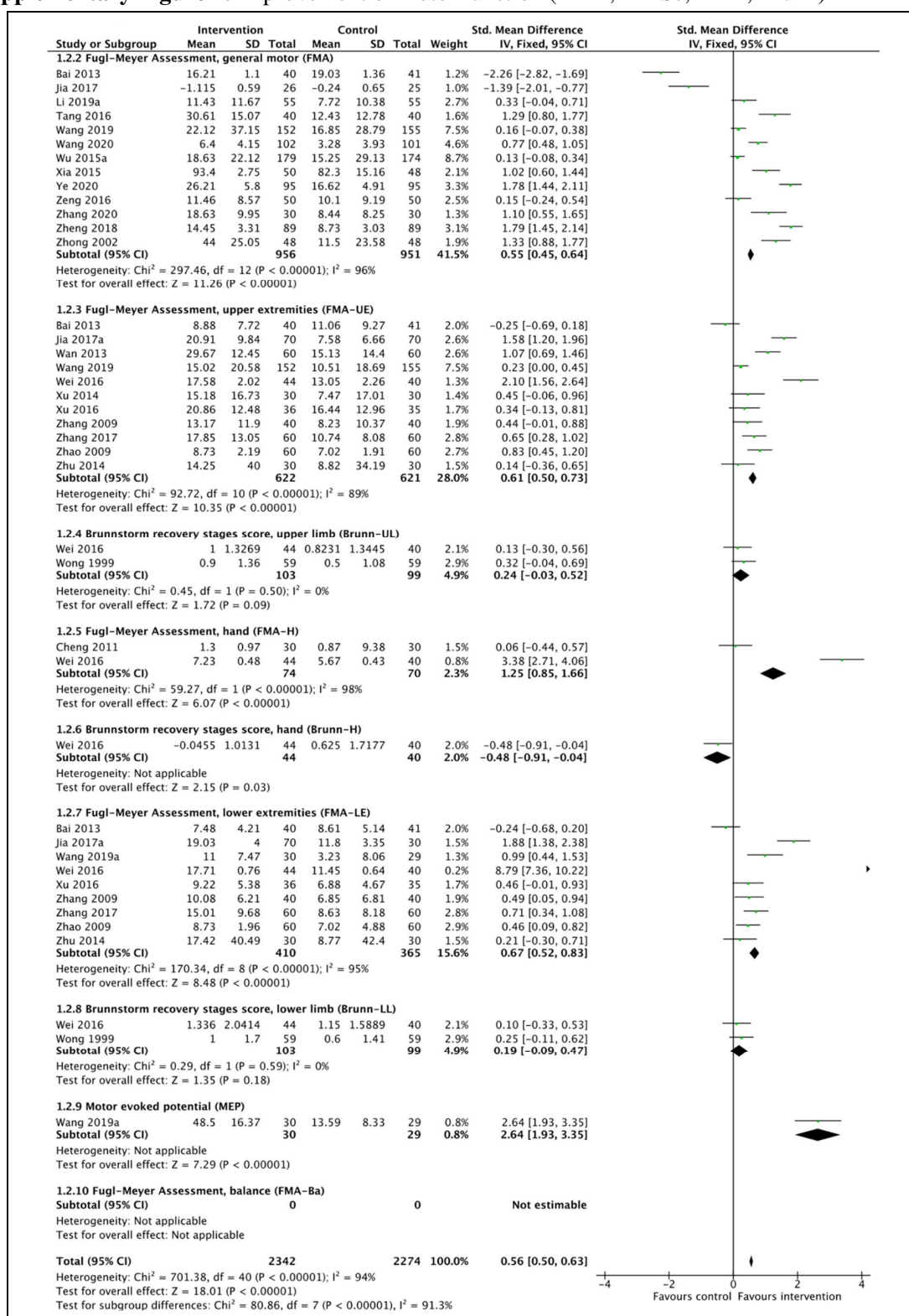
**Supplementary Figure 1. Improvement of dependency (BI, MBI, ADL)**



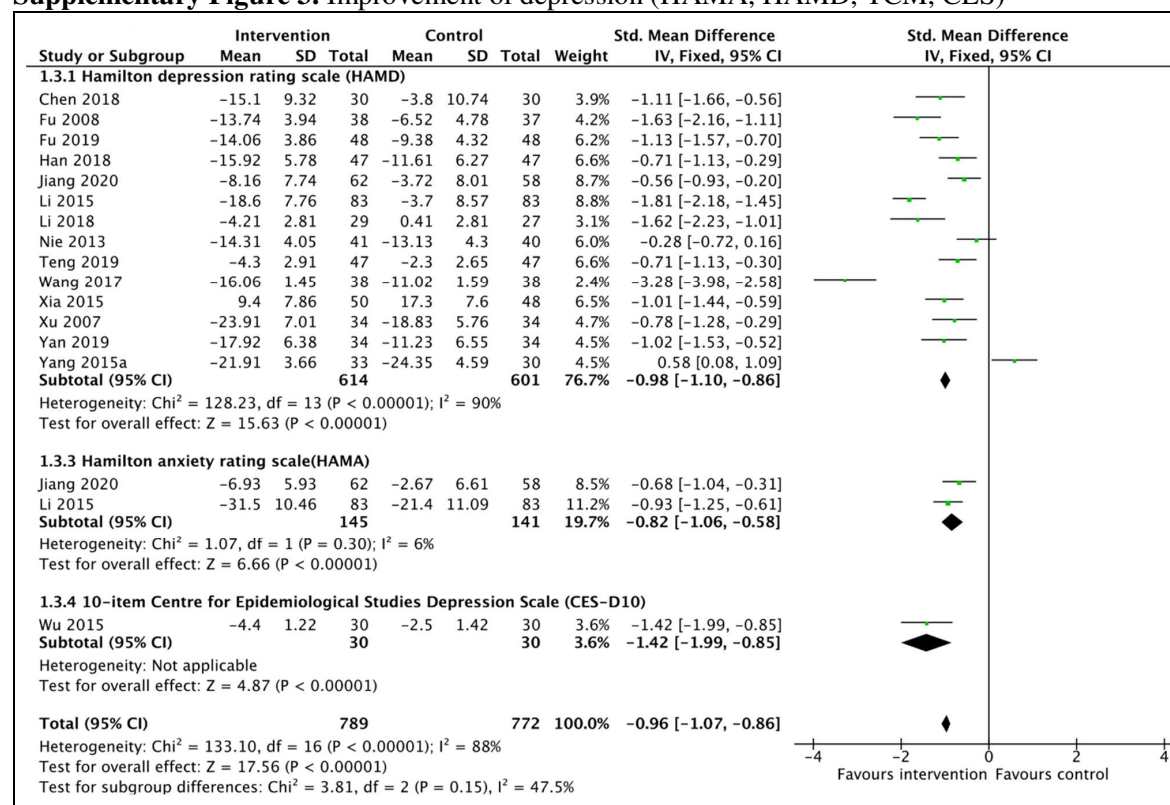
\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.



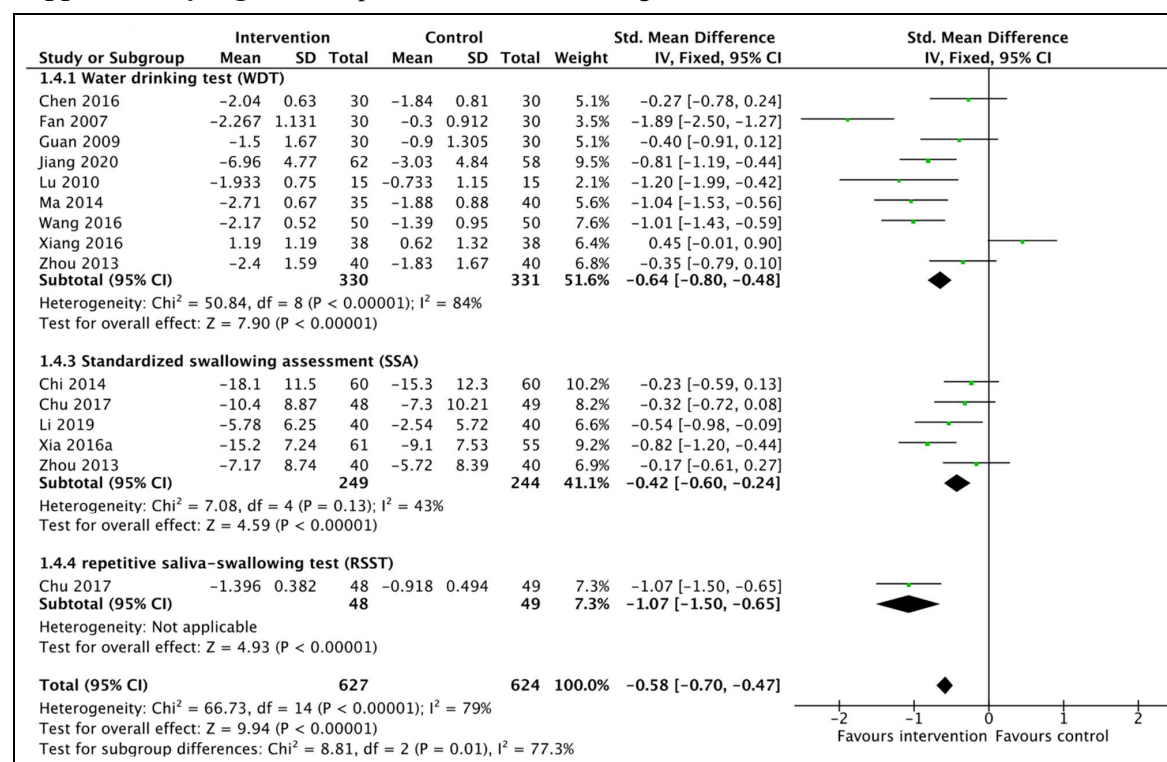
Supplementary Figure 2. Improvement of motor function (FMA, MASc, MEP, Brunn)



\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.

**Supplementary Figure 3. Improvement of depression (HAMA, HAMD, TCM, CES)**

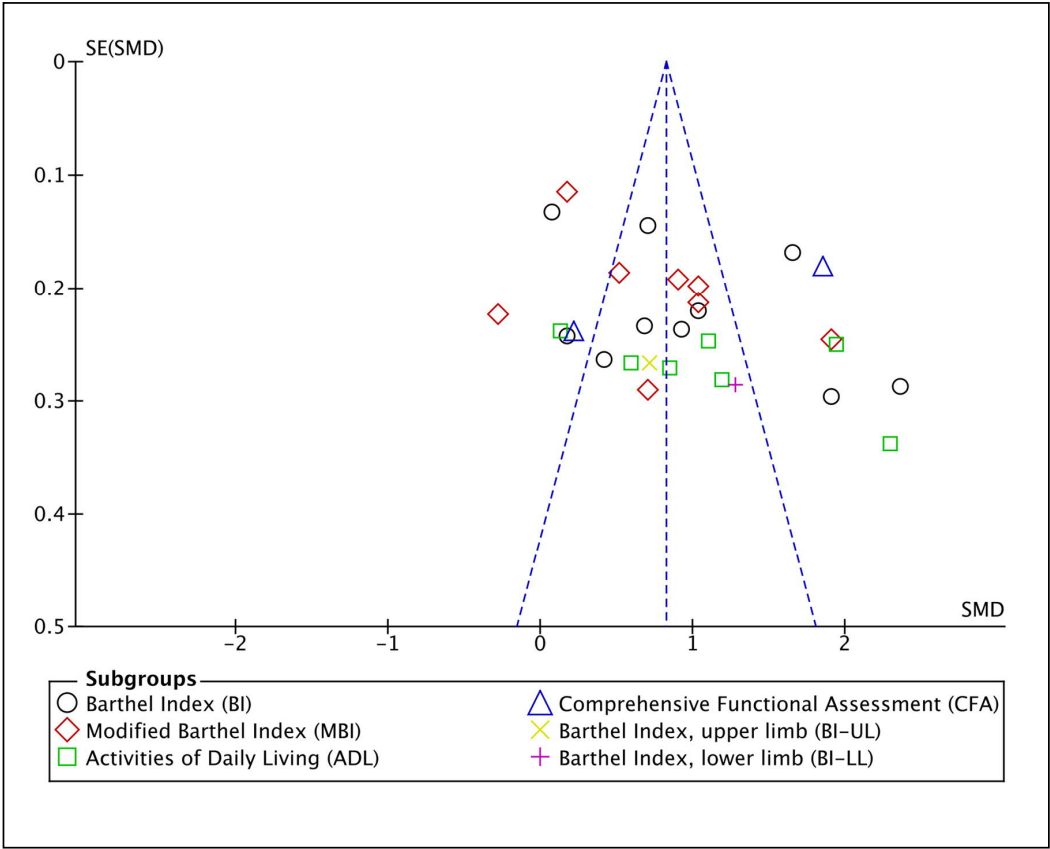
\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.

**Supplementary Figure 4. Improvement of swallowing function (WDT)**

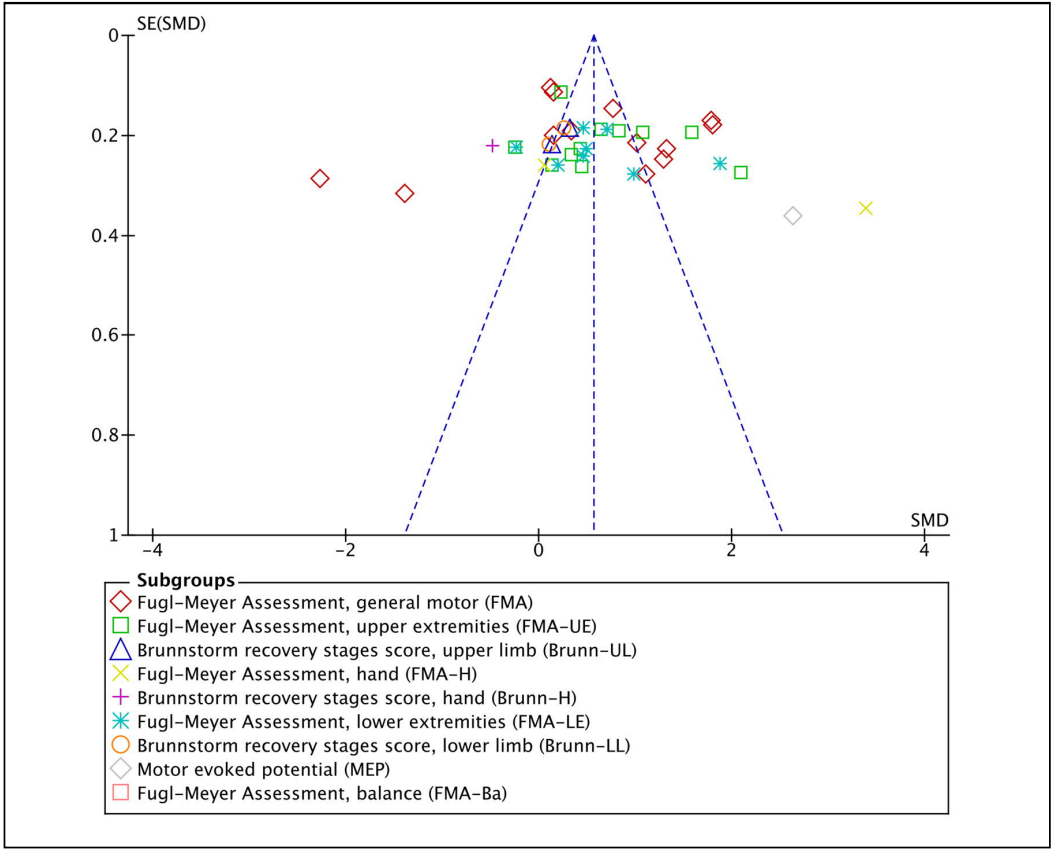
\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.

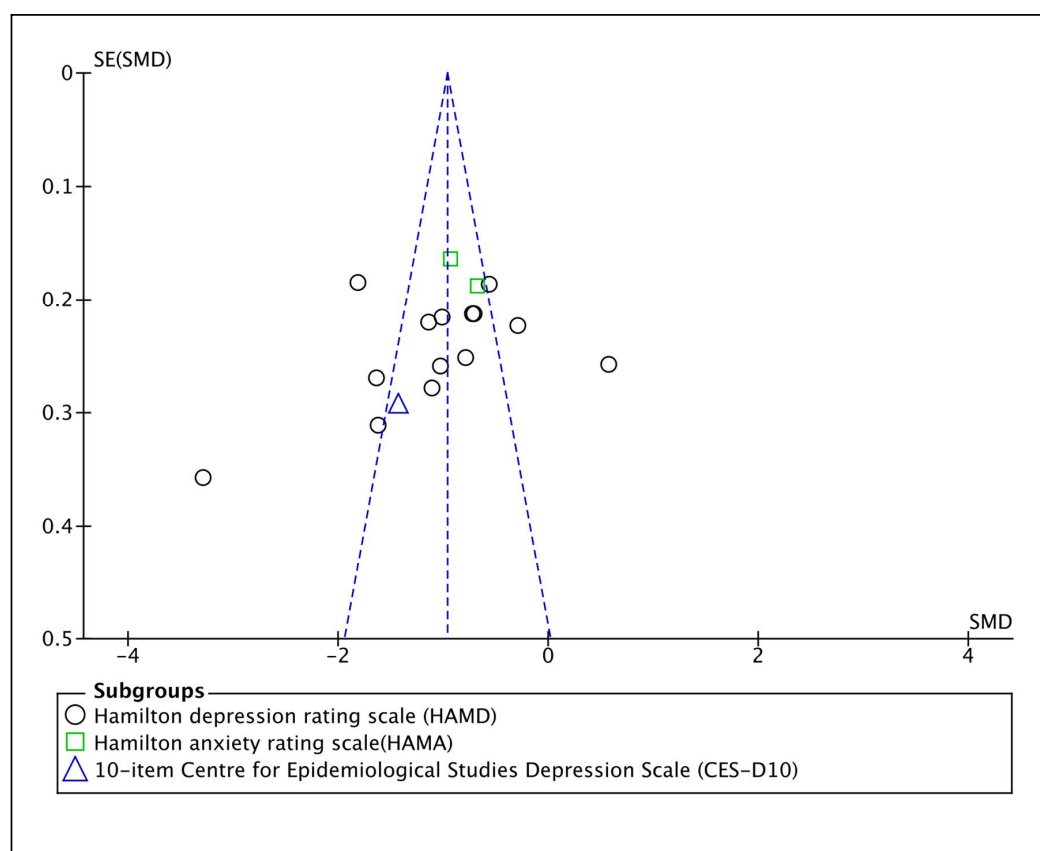


**Supplementary Figure 5.** Funnel plot for outcome: Improvement of dependency



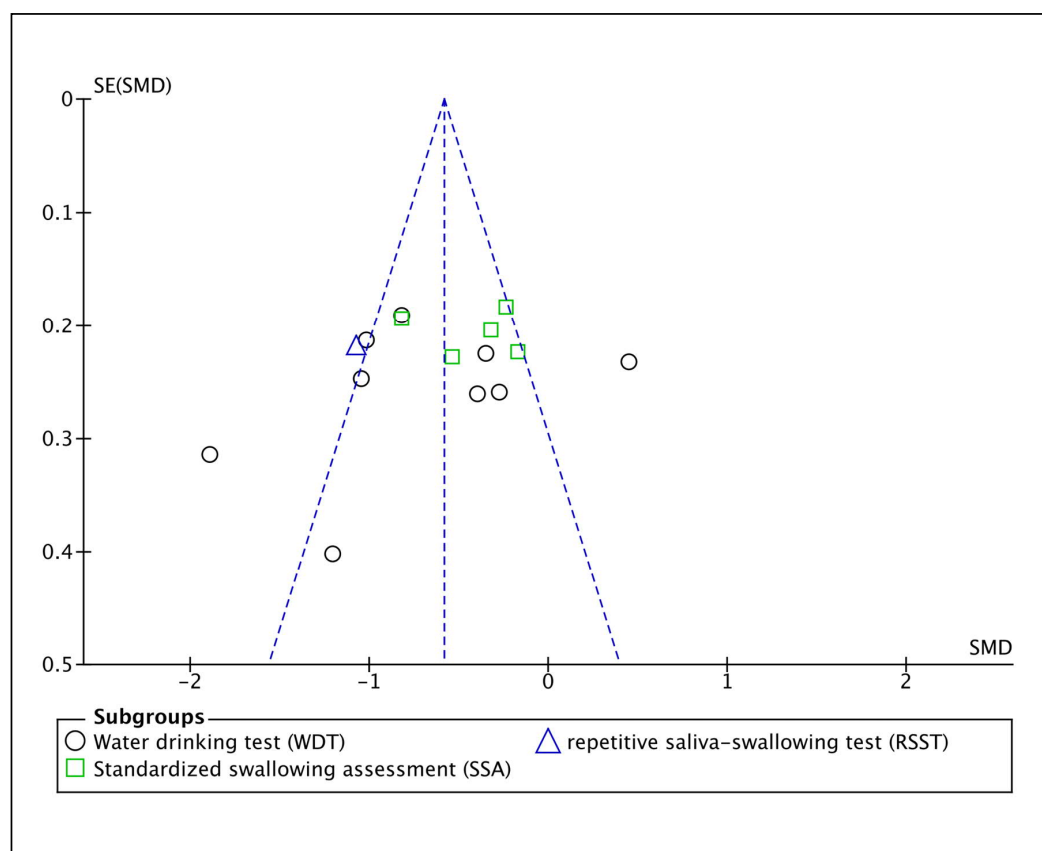
Supplementary Figure 6. Funnel plot for outcome: Improvement of motor function

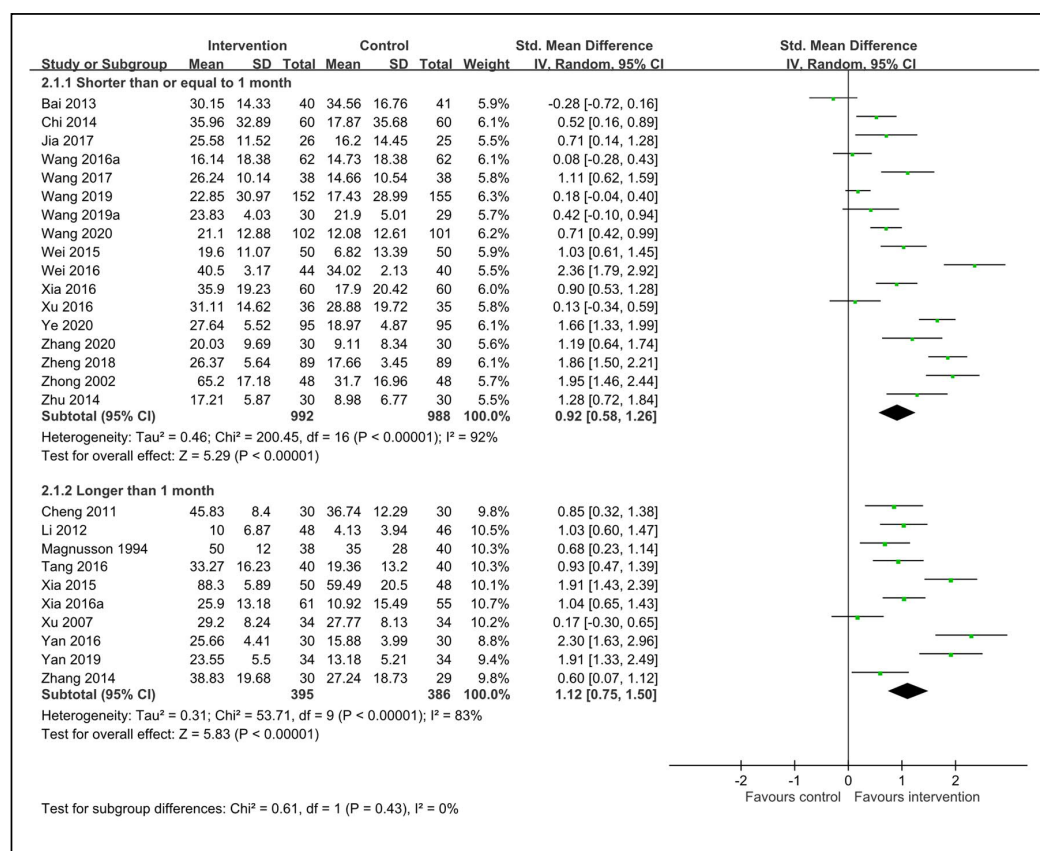


**Supplementary Figure 7.** Funnel plot for outcome: Improvement of depression

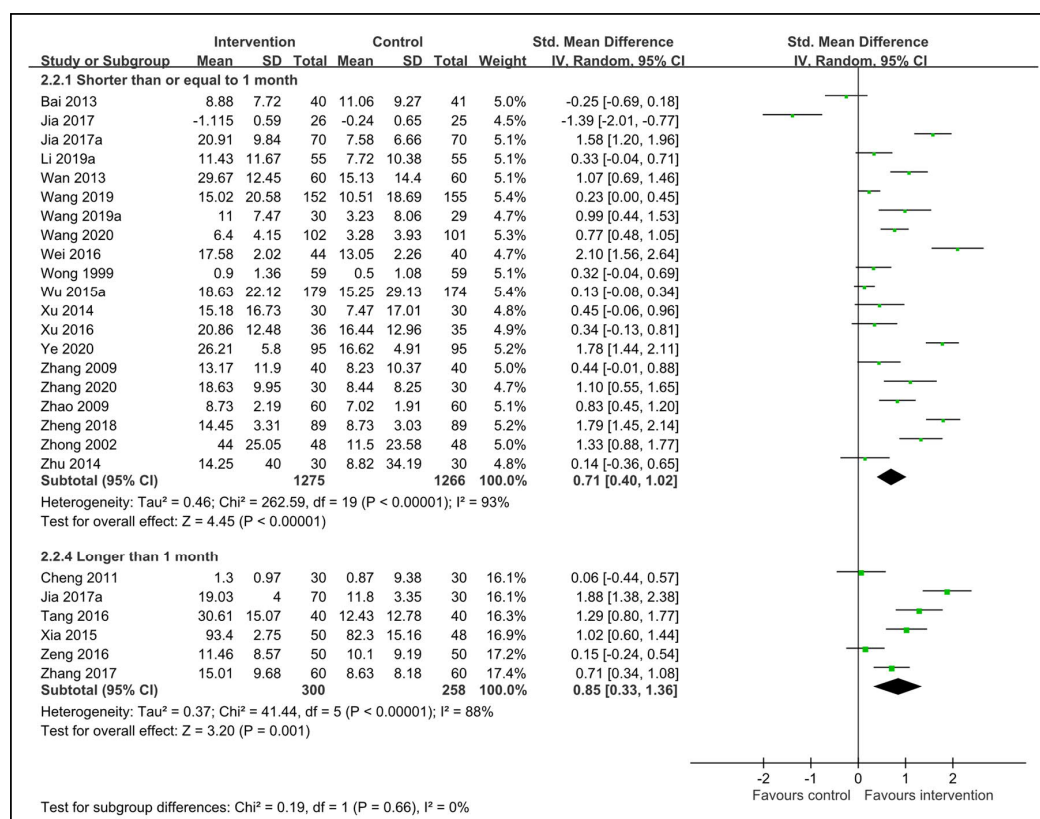


**Supplementary Figure 8.** Funnel plot for outcome: Improvement of swallowing function



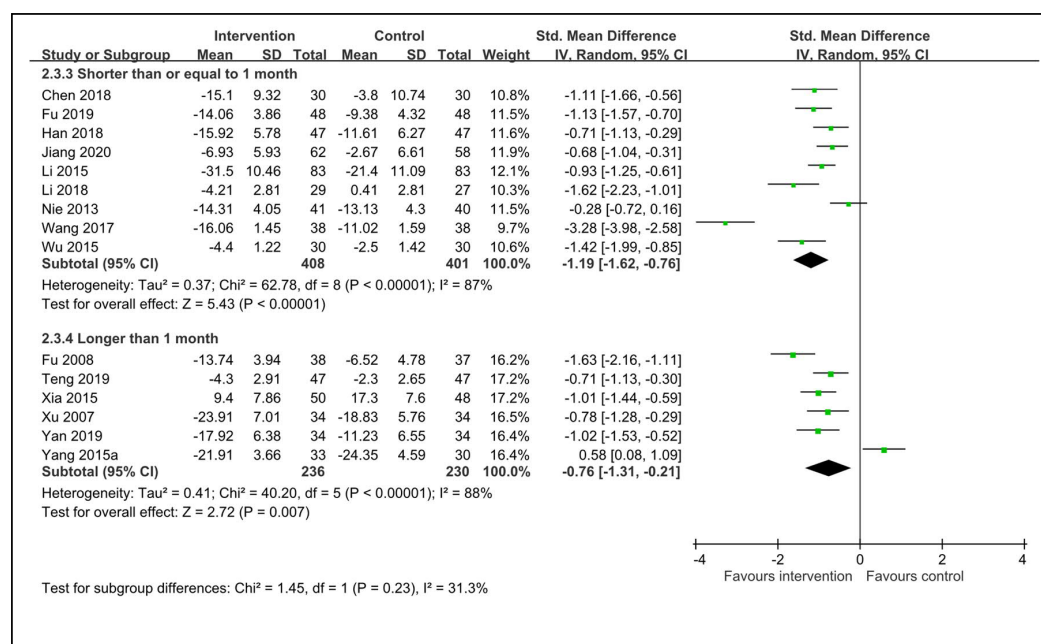
**Supplementary Figure 9. Comparison on duration of treatment: Improvement of dependency**

\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.

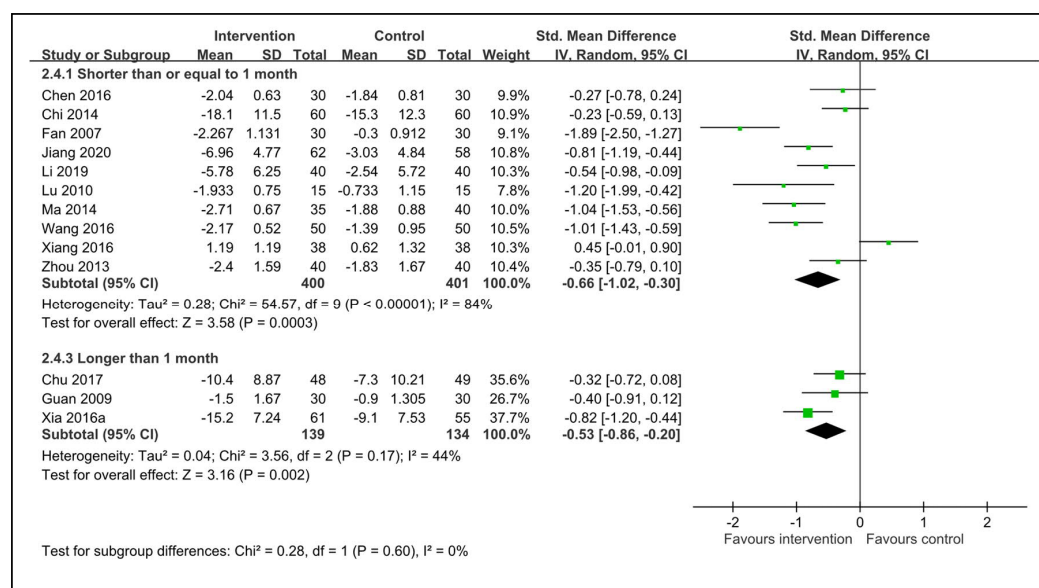
**Supplementary Figure 10.** Comparison on duration of treatment: Improvement of motor function

\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.



**Supplementary Figure 11.** Comparison on duration of treatment: Improvement of depression

\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.

**Supplementary Figure 12.** Comparison on duration of treatment: Improvement of swallowing function

\* The reference for each study have been listed in Table 2 and 'List of included studies' references'.

## Criteria for judging risk of bias

### 1. Random sequence generation (selection bias)

- Low risk: random number table; computer random number generator;
- High risk: date of admission; odd or even clinic record number
- Unclear risk: randomization was stated, but the process was not described

### 2. Allocation concealment (selection bias)

- Low risk: central allocation (telephone or web-based); sequentially numbered sealed envelopes; or real-time randomization
- High risk: participants or the investigators enrolling participants could potentially predict the assignments
- Unclear risk: method of concealment was not described or not described in sufficient detail

### 3. Blinding participants and personnel (performance bias)

- Low risk: Blinding of participants and key study personnel was ensured, or it was unlikely that the blinding was compromised, blinding of participants and personnel to the hypothesis or study objectives.
- High risk: open label; no blinding or incomplete blinding; or attempted blinding of key study participants and personnel, but it was likely that the blinding was compromised
- Unclear risk: insufficient information to permit the judgment of 'low risk' or 'high risk'

### 4. Blinding of outcome assessment (detection bias)

- Low risk: Blinding of outcome assessment was ensured. No blinding of outcome assessment, but the review authors judged that the outcome measurement was not likely to be influenced by a lack of blinding
- High risk: open label, no blinding of outcome assessment and the outcome measurement was likely to be influenced by lack of blinding
- Unclear risk: insufficient information to permit the judgment of 'low risk' or 'high risk'

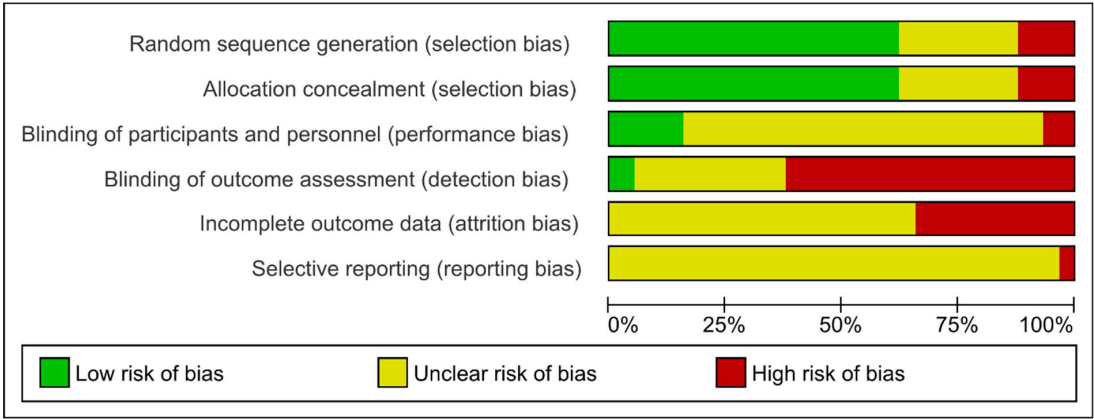
### 5. Incomplete outcome data (attrition bias)

- Low risk: intention-to-treat analysis; no missing outcome data; reasons for missing outcome data unlikely to be related to outcome; or missing outcome data were balanced across intervention groups
- High risk: 'As-treated' analysis; reason for missing outcome data likely to be related to outcome; proportion of missing outcomes compared with observed event risk was sufficient to induce clinically relevant bias in the intervention effect estimate
- Unclear risk: insufficient reporting of dropout and exclusion to permit the judgment of 'low risk' or 'high risk' (e.g. number randomized not stated, no reasons for missing data provided)

### 6. Selective reporting (reporting bias)

- Low risk: The study protocol was available, and all of the study's prespecified outcomes that were of interest in the review were reported in a prespecified manner; or the study protocol was not available, but it was clear that the published reports include all expected outcomes, including those that were prespecified
- High risk: Not all of the study's prespecified outcomes were reported; or one or more reported primary outcomes were not prespecified
- Unclear risk: insufficient information for a clear decision

Risk of bias within studies



Supplementary Figure 13. Risk of bias graph

	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)
Bai 2013	?	?	?	●	●	?
Chen 2016	+	+	?	●	●	?
Chen 2018	+	+	?	?	?	?
Cheng 2011	●	●	?	●	●	?
Chi 2014	?	?	●	?	●	●
Chu 2017	●	●	?	●	●	?
Fan 2007	+	+	?	●	?	?
Fu 2008	+	+	+	+	?	?
Fu 2019	+	+	?	●	?	?
Guan 2009	●	●	?	●	●	?
Han 2018	●	●	?	●	●	●
Jia 2017	+	+	?	?	?	?
Jia 2017a	?	?	●	●	●	?
Jiang 2020	+	+	?	●	●	?
Li 2012	+	+	?	●	●	?
Li 2015	?	?	?	●	?	?
Li 2018	+	+	+	+	?	?
Li 2019	+	+	?	●	●	?
Li 2019a	+	+	?	●	?	?
Lu 2010	?	?	?	●	●	?
Ma 2014	+	+	+	+	?	?
Magnusson 1994	?	?	?	?	?	?
Nie 2013	+	+	?	●	●	?
Tang 2016	●	●	?	●	?	?
Teng 2019	+	+	?	?	?	?



Wan 2013	+	+	?	+	?	?
Wang 2016	?	?	?	+	+	?
Wang 2016a	+	+	?	+	+	?
Wang 2017	+	+	?	+	?	?
Wang 2019	+	+	?	+	?	?
Wang 2019a	+	+	?	+	?	?
Wang 2020	?	?	+	+	+	?
Wei 2015	?	?	?	+	?	?
Wei 2016	+	+	+	?	?	?
Wong 1999	+	+	?	?	?	?
Wu 2015	+	+	?	?	?	?
Wu 2015a	+	+	?	?	?	?
Xia 2015	?	?	?	+	?	?
Xia 2016	+	+	+	?	?	?
Xia 2016a	+	+	+	?	?	?
Xiang 2016	?	?	?	+	+	?
Xu 2007	+	+	?	?	?	?
Xu 2014	+	+	?	+	?	?
Xu 2016	?	?	?	+	+	?
Yan 2016	+	+	+	+	+	?
Yan 2019	+	+	?	?	?	?
Yang 2015a	+	+	?	?	?	?
Ye 2020	+	+	?	+	?	?
Zeng 2016	+	+	?	?	?	?
Zhang 2009	+	+	+	?	?	?
Zhang 2014	+	+	+	?	?	?
Zhang 2017	+	+	?	+	?	?
Zhang 2020	+	+	?	+	?	?
Zhao 2009	+	+	+	?	?	?
Zheng 2018	?	?	?	+	?	?
Zhong 2002	?	?	?	+	?	?
Zhou 2013	+	+	?	+	+	?
Zhu 2014	?	?	?	?	?	?

Supplementary Figure 14. Risk of bias summary

## Supplementary Tables

**Supplementary Table 1.** Search Strategy

■	MEDLINE(Ovid), 1948 to 24 Jul 2019 and EMBASE(Ovid), 1974 to 24 Jul. 2019
1	exp basal ganglia cerebrovascular disease/
2	cerebrovascular disorders/
3	exp brain ischemia/
4	exp carotid artery diseases/
5	exp cerebral small vessel diseases/
6	exp intracranial arterial diseases/
7	exp "intracranial embolism and thrombosis"/
8	exp intracranial hemorrhages/
9	stroke/
10	exp brain infarction/
11	stroke, lacunar/
12	vasospasm, intracranial/
13	vertebral artery dissection/
14	(stroke or post stroke or post-stroke).tw.
15	(cerebrovasc\$ or brain vasc\$ or cerebral vasc\$ or cva\$ or apoplex\$ or SAH).tw.
16	((brain\$ or cerebr\$ or cerebell\$ or intracran\$ or intracerebral) adj5 (isch?emi\$ or infarct\$ or thrombo\$ or emboli\$ or occlus\$)).tw.
17	((brain\$ or cerebr\$ or cerebell\$ or intracerebral or intracranial or subarachnoid) adj5 (haemorrhage\$ or hemorrhage\$ or haematoma\$ or hematoma\$ or bleed\$)).tw.
18	hemiplegia/
19	exp paresis/
20	(hemipleg\$ or hemipar\$ or paresis or paretic).tw.
21	brain injuries/
22	brain injury, chronic/
23	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22
24	acupuncture/ or acupuncture therapy/ or acupuncture analgesia/ or acupuncture, ear/ or electroacupuncture/ or meridians/ or acupuncture points/ or trigger points/

25	(acupuncture\$ or electroacupuncture or electro-acupuncture or acupoint\$ or meridians or needling).tw.
26	((meridian or non-meridian or trigger) adj10 point\$).tw.
27	24 or 25 or 26
28	exp drugs, chinese herbal/
29	exp medicine, chinese traditional/
30	exp Plants, Medicinal/
31	exp Medicine, Traditional/
32	exp Plant Extracts/
33	exp Phytotherapy/
34	phytopharmaceutic\$.mp.
35	herb\$.mp.
36	traditional medicine\$.mp.
37	traditional therap\$.mp.
38	herbal medicine\$.mp.
39	herbal therap\$.mp.
40	aconite root.mp.
41	camelia.mp.
42	cayenne.mp.
43	chinese cucumber.mp.
44	chrysanthemum flower\$.mp.
45	cocklebur fruit.mp.
46	cow dipper.mp.
47	croton seed.mp. or exp Croton/
48	ginger.mp. or exp Ginger/
49	ginkgo.mp. or exp Ginkgo biloba/
50	ginseng.mp. or exp Panax/
51	goji berry.mp.
52	horny goat weed.mp.
53	rhubarb.mp. or exp Rheum/
54	thunder vine.mp.
55	strychnine tree.mp.
56	sweet wormwood.mp.
57	willow bark.mp.
58	27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57
59	23 and 58

60	(animals not (human and animals)).sh.
61	59 not 60
<p>■ Cochrane (Wiley interface), searched on 24 Jul 2019</p> <p>1 MeSH descriptor: [Medicine, Chinese Traditional] explode all trees</p> <p>2 MeSH descriptor: [Drugs, Chinese Herbal] explode all trees</p> <p>3 MeSH descriptor: [Medicine, Traditional] explode all trees</p> <p>4 ((traditional or herbal) and (therap* or medicine*)):ti,ab,kw</p> <p>5 #1 or #2 or #3 or #4</p> <p>6 (acupuncture):ti,ab,kw OR (electroacupuncture):ti,ab,kw OR (meridians):ti,ab,kw OR (acupuncture*):ti,ab,kw OR (acupoints):ti,ab,kw</p> <p>7 ((meridian or non-meridian or trigger) adj10 point\$):ti,ab,kw</p> <p>8 MeSH descriptor: [Acupuncture Therapy] explode all trees</p> <p>9 #6 or #7 or #8</p> <p>10 #5 or #9</p> <p>11 MeSH descriptor: [Stroke Rehabilitation] explode all trees</p> <p>12 (stroke):ti,ab,kw</p> <p>13 #11 or #12</p> <p>14 #10 and #13</p>	
<p>■ CNKI, 1915 to 24 Jul 2019</p> <p>1 SU=(卒中+脑梗+心梗)*(针+中医+中药)*(随机+对照)</p>	

**Supplementary Table 2.** Characteristics of included studies (ordered by study ID)

ID	Title	Method	No. of participants	Age range	Type of health problem	Disease course	Duration of Treatment	Name of decoction and herbal medicine or acupoints	Outcomes	No. of Drop outs	Duration of follow-up	Is blind method used in outcome assessment? If yes, who is/are blinded?
Bai 2013 <sup>[35]</sup>	Prospective, randomized controlled trial of physiotherapy and acupuncture on motor function and daily activities in patients with ischemic stroke	RCT	120	61.54 ±9.47	Motor function problem	15 days - 90 days	4 weeks	Baihui, Jianyu, Jianzhen, Quchi, Waiguan, Hegu, Yanglingquan, Kunlun, Juegu, Huantiao, Fengshi, Neiguan, Shangqiu, Taichong, Yinlingquan, Sanyingjiao, Yingu, Daling, Houxi, Jiquan, Chize, Quze	FMA MBI	NA	NA	NA



Chen 2018 <sup>[23]</sup>	Effect of early acupuncture intervention on post - stroke depression: a randomized controlled trial	RCT	60	36 - 75	Depression	4 to 30 days	4 weeks	Baihui, Sishencong, Neiguan, Hegu, Taixi, Taichong, Zusanli, Xuehai	Clinical effective rate HAMD MESSS	NA	4 Weeks	NA
Cheng 2011 <sup>[14]</sup>	Post - stroke hand dysfunction treated with acupuncture at Zhongzhu (TE 3) and Waiguan (TE 5)	Quasi-RCT	60	<sup>^</sup> 41 - 74 * 43 - 77	Motor function problem	<sup>^</sup> 86.6 ± 16.2 days * 88.1 ± 12.5 days	8 weeks	Waiguan, Zhongzhu	FMA - Hand NIHSS Holden ADL	NA	NA	NA
Xia 2010 <sup>[36]</sup>	Combination of Feeding - Swallowing Training and Acupuncture: an Effective Rehabilitation Method for Post - Stroke Dysphagia	RCT	120	<sup>^</sup> 65.32 ± 14.85 * 66.40 ± 15.63	Dysphagia	<sup>^</sup> 8.94 ± 3.62 days * 9.20 ± 13.78 days	4 weeks	Yamen, Fengchi, Jingjiaji, Lianquan, Baihui, Zhaohai	SSA VFSS MBI SW - AL - QOL	NA	NA	NA
Chu 2017 <sup>[34]</sup>	Effects of GAO's neck acupuncture on swallowing function and quality of life in patients with post - stroke pseudobulbar palsy:a	Quasi-RCT	100	<sup>^</sup> 67 ± 11 * 67 ± 10	Dysphagia	acu: 41.1 ± 38.6 days ctr: 40.5 ± 30.8 days	8 weeks	Fengchi, Yiming, Gongxue, Zhiqiang, Tunyan, Fayin, Lianquan, exteriorJinjin, exteriorYuye	RSST SSA SWAL - QOL WDT	3	NA	NA

	randomized controlled trial											
Fan 2007 <sup>[28]</sup>	Clinical Observations on Acupuncture Treatment of Post - Stroke Dysphagia	RCT	60	NA	Dysphagia	NA	NA	Tiantu, anteriorLianquan, upperLianquan, Lianquan, Fengchi, Wangu, Lieque, Fulu, Zusanli, Fenglong	WDT Clinical effective rate	NA	NA	NA
Fu 2008 <sup>[19]</sup>	Efficacy and safety of Deanxit combined with Wuling Capsule in treating post - stroke depression: a randomized controlled trial	RCT	120	45 - 78	Depression	NA	6 weeks	Wuling Capsule: Wulingjun	Clinical effective rate HAMD	6	NA	yes; outcome assessors
Guan 2009 <sup>[37]</sup>	Therapeutic effect of acupuncture plus deglutition training on patients with dysphagia caused by brainstem stroke	Quasi-RCT	60	$61.2 \pm 6.5$ * $59.3 \pm 7.1$	Dysphagia	$23.25 \pm 6.07$ days * $25.11 \pm 5.54$ days	2month	Lianquan, Tiantu, Fengchi, Renying, Hegu	WDT		NA	NA
Jia 2017 <sup>[38]</sup>	Spasmodic hemiplegia after stroke treated with scalp acupuncture, music	RCT	76	$61 \pm 11$ $58 \pm 12$	Motor function	2 week - 3 months	4 weeks	anteriorShencong, Xuanli, Baihui, Qubin	FMA BI MAS	NA	NA	NA

	therapy and rehabilitation: a randomized controlled trial			* 63±11	problem							
Li 2012 <sup>[9]</sup>	Observation on therapeutic effect of acupuncture combined with medicine on mild cognition disorders in patients with post - stroke	RCT	100	40 - 79	Cognitive disorder	NA	3 months	Baihui, Shenting, Qucha, Shencong, Fengchi, Neiguan, Hegu, Zusanli, Sanyinjiao, Daxi, Zhaohai	Clinical effective rate MMSE HDS - R BI	6	NA	NA
Li 2015 <sup>[20]</sup>	83 cases of depression due to stroke treated with therapy of integrated traditional Chinese and western medicine	RCT	166	30 - 75	Depression	1 to 24 months	1 month	Modified Xiaoyansan: Baishao, Danggui, Chuanxiong, Chaihu, Yujin, Taoren, Honghua, Zhigancao	Clinical effective rate HAMA HAMD	NA	NA	NA
Li 2018 <sup>[39]</sup>	Clinical observation on auricular magnetotherapy for convalescent stroke patients with depression	RCT	93	^ 59±11 * 59±12	Depression	NA	4 weeks	Gan, Xin, Pi, Shen, Shenmen, Pizhixia	Clinical effective rate HAMD SS - QOL	10	4 weeks	yes, outcome accessors
Li 2019 <sup>[29]</sup>	Influence of nape acupuncture therapy on swallowing function of patients with cerebral infarction	RCT	80	^ 40 * 40	Dysphagia	^ 61.9±7.9 days *	^ 16.9±7.1 *	Fengchi, Yiming, Gongxue, Zhiqiang, Tunyan, Lianquan, exteriorJinjin, exteriorYuye	FEES WDT SSA PAS		NA	NA

						63.6±6.9 days	18.5±8.1					
Lu 2010 <sup>[30]</sup>	Therapeutic effects of neuromuscular electrical stimulation and electroacupuncture for dysphagia post stroke	RCT	45	59.87±7.94 ^ 60.65±9.33 * 60.96±8.25	Dysphagia	18.79±5.88 days ^ 17.85±7.09 days * 17.53±5.62 days	3 weeks	Lianquan, Hegu, Neiguan, Zusanli, Zhaohai	WDT VFSS	NA	NA	NA
Ma 2014 <sup>[40]</sup>	Post - stroke dysphagia treated with acupoint injection combined with neural electrical stimulation	RCT	183	^ 50.6±11.1 47.25±10.5 * 51.2±10.8 49.9±11.8 51.5±10.9	Dysphagia	^ 25.3±8.4 days 23.8±5.2 days *24.4±7.1 days 25.2±6.9 days 24.5±5.7 days	30days	Tunyanxue	WDT Clinical effective rate	55	NA	yes; outcome assessors, data analysts

Magnusson 1994 <sup>[41]</sup>	Sensory stimulation with acupuncture promotes normalization of the dynamic control of posture after hemispheric stroke	RCT	78	54 - 89	Motor function problem	≤10days	11 weeks	upperJuxu, Zusanli, Yanglingquan, Yuji, Chize, Waiguan, Baihui, Yinshi, Zhongfu, Taichong	Barthel Index Balance score	30days	1 year	NA
Nie 2013 <sup>[25]</sup>	Post - stroke depression treated with acupuncture and moxibustion: an evaluation of therapeutic effect and safety	RCT	123	51 - 81	Depression	NA	4 weeks	Acupuncture: Hegu, Taichong, Baihui, Yintang Moxibustion: Zhongwan, Xiawan, Guanyuan, Qihai	Clinical effective rate HAMD BI	NA	NA	NA
Wang 2016 <sup>[31]</sup>	The study of acupuncture and swallowing training in the treatment of dysphagia after stroke	RCT	100	^ 50 * 50	Dysphagia	^ 134.28±58.34 days * 128.35±74.31 days	28 days	Fengchi, Wangu, Tianzhu, Lianquan, interiorDaying, Fenglong, Jinjin, Yuye	WDT Fujishima Ichiro swallowing effect score Clinical effective rate		NA	NA



Wang 2019 <sup>[42]</sup>	Effect of Tui Na on upper limb spasticity after stroke: a randomized clinical trial	RCT	444	18 - 75	Motor function problem	1 to 3 months (270) 4 to 6 months (101) 7 to 12 months (67)	4 weeks	Jianyu, Jianliao, Quchi, Neiguan, Waiguan, Shousanli, Yangchi, Hegu	Mini - Mental Status Examination MAS FMA MBI	54	24 weeks	NA
Wang 2019a <sup>[10]</sup>	Effects of acupuncture treatment on lower limb spasticity in patients following hemorrhagic stroke: A pilot study	RCT	59	40 - 70	Motor function problem	30 to 90 days	4 weeks	Baihui, Taiyang, Yinmen, Fuxi, Xiyangguan, Yanglingquan, Zusanli, Tiaokou, Taichong	MAS FMA BI MEP IEMG	0	NA	NA
Wei 2015 <sup>[11]</sup>	Clinical study of acupuncture combined with rehabilitation training in the treatment of dysphagia after stroke	RCT	100	<sup>^</sup> 61.50 ±4.20 * 62.50 ±4.90	Dysphagia	NA	2 weeks	Lianquan, Tiantu, Jinjin, Yuye, Hegu, Neiguan, Zusanli	MBI FIM	NA	NA	NA
Wei 2016 <sup>[43]</sup>	Synergistic effect of moxibustion and rehabilitation training in functional recovery of	RCT	84	<sup>^</sup> 53.15 ±14.2 3 *	Motor function problem	<sup>^</sup> 61.61±8 .75 days *	4 weeks	Zhongdi, Jiansui, Quchi, Shousanli, Waiguan, Hegu, Yanglingquan, Zusanli, Xuanzhong, Sanyinjiao	Brunnstrom MAS CSI FMA	NA	6 months	yes , outcome assessors

	post - stroke spastic hemiplegia			52.52 ±13.5 1		51.44±8 .143 days (2 weeks to 2 months)			MBI PRO			
Wong 1999 <sup>[44]</sup>	Clinical trial of electrical acupuncture on hemiplegic stroke patients	RCT	118	^ 21 - 80 * 25 - 78	Motor functi on proble m	10 - 14 days from onset	2 weeks	Jianjing, Jianliao, Shousanli, Hegu, Futu, Xuehai, Yanglingquan, Taichong			NA	NA
Wu 2015 <sup>[26]</sup>	30 cases of depression of post stroke with treatment Kaiyu Ditan Decoction	RCT	60	^ 58.1± 10.72 * 59.3± 9.97	Depre ssion	NA	4 weeks	Kaiyuditan Decoction : Banxia, Chenpi, Zhizi, Zhuru, Dannanxing, Shichangpu, Yujin, Fuling, Zhishi, Qingpi, Houpu, Chaihu, Foshou, Zisu, Chuanxiong, Chaobaizhu, Shengjiang, Ganciao	CES - D10	NA	NA	NA

29

				±11.4 1  Centre 2 : 60.53 ±13.4 7  Centre 3 : 60.48 ±10.6 5  Centre 4 : 63.50 ±11.3 8)		3 : 20.25±1 9.75 Centre 4 : 22.00±5 .03)						
Xia 2015 <sup>[12]</sup>	Clinical observation of acupuncture plus rehabilitation training for post - stroke depression	RCT	108	67±8	Depre ssion	^ 40.2±13 .7 days *	8 weeks	Yintang, Baihui, Sishencong, Zusanli, Sanyinjiao, Taichong, Neiguan, Shuigou,	ADL HAMD FMA MBI	10	3 months	NA

						38.9±11.6 days		Jiquan, Chize, Weizhong, Shenting				
Xia 2016 <sup>[45]</sup>	Does the addition of specific acupuncture to standard swallowing training improve outcomes in patients with dysphagia after stroke? a randomized controlled trial	RCT	124	40 - 80	Dysphagia	4 - 12days	six days of therapy per week for a four - week period	Fengchi, Jiaji, Lianquan, Jiajianquan, Baihui, Lieque, Fenglong, Sanyinjiao, Jinjin, Yuye, Taixi, Zhaohai	SSA DOSS MBI SWAL - QOL	4 A(2) B(2)	NA	yes, evaluators
Xia 2016a <sup>[13]</sup>	Post - stroke dysphagia treated with acupuncture of meridian differentiation:a randomized controlled trial	RCT	116	^ 67±9 * 66±10	Dysphagia	^ 21.8±9.5 * re:20.4±8.7	6weeks	Neiguan, Shuigou, Sanyinjiao, Jiquan, Chize, Weizhong, Baihui, Fengchi, Lianquan, Jialiangquan, Jinjin, Yuye	SSA VFSS MBI SW - AL - QOL	14	3 months	yes; outcome assessors
Xu 2007 <sup>[5]</sup>	Observation on effect of Wuling Capsule in treating poststroke depression	RCT	108	44 - 79	Depression	NA	3 months	Wuling Capsule: Wulingjun	HAMD MMSE SSS BI	4	NA	NA



Yan 2016 <sup>[46]</sup>	Therapeutic observation of thunder - fire moxibustion at Dazhui (GV14) and Shenshu (BL23) plus cognitive training for mild cognitive impairment due to ischemic cerebral stroke	RCT	60	43 - 80	Cognitive disorder	NA	8 weeks	Dazhui, Shenshu	Clinical effective rate MoCA MMSE ADL WMS	NA	NA	NA
Yang 2015a <sup>[27]</sup>	Clinical observation on the treatment with acupuncture combined with medicine on 33 cases with depression after apoplexy	RCT	63	30 - 80	Depression	1.94 years	6 weeks	Shenmen, Naogan, Xinggan, Shen	Clinical effective rate HAMD	NA	NA	NA
Zeng 2016 <sup>[47]</sup>	Clinical study on acupuncture for ambulation disturbance in subacute stage of cerebral stroke	RCT	100	^ 66±12 * 68±10	Motor function problem	^ 34.74±2.92 * 34.18±2.86	8 weeks	Jiayu, Naohui, Shousanli, Waiguan, Zhongzhu, Chengfu, Yinmen, Weizhong, Yanglingquan, Chengjin	NIHSS FMA Bathel Score FAC Safety	NA	NA	NA
Zhang 2009 <sup>[17]</sup>	Effect of heat - reinforcing needling combined with rehabilitation training on	RCT	80	^ 65.9±11.1 *	Motor function	<= 2 weeks	3 weeks	Jiayu, Quchi, Hegu, Yanglingquan, Yinlingquan, Zusanli, Sanyinjiao	Fugl - Meyer effective rate	NA	NA	yes; outcome assessors

	the motor function of ischemic stroke patients			69.2±9.7	problem							
Zhang 2014 <sup>[48]</sup>	Observation on efficacy of acupuncture combined with rehabilitation training for post - stroke balance disorders	Quasi-RCT	59	30 - 75	Balance disorder	3 to 11 months	16 weeks	Dazhu, Dushu, Ganshu, Shenshu, Dachangshu, Guanyuanshu, Futonggu, Huangshu, Qixue, Liangmen, Tianshu, Daju, Fushe, Daheng, Fuai	Berg score ADL	NA	NA	NA
Zhang 2017 <sup>[49]</sup>	Neuronavigation - Assisted Aspiration and Electro - Acupuncture for Hypertensive Putaminal Hemorrhage: A Suitable Technique on Hemiplegia Rehabilitation	RCT	240	^ 57.2±9.6 * 56.72±8.3	Motor function problem	NA	8 weeks	Jiquan, Quchi, Shousanli, Hegu, Waiguan, Jianyu, Jianliao, Binao, Yanglingquan, Zusanli, Baihui, Dazhui, Chengshan, Sanyinjiao	FMA - UL FMA - LL MAS BI	NA	NA	NA
Zhao 2009 <sup>[18]</sup>	Effect of acupuncture treatment on spastic states of stroke patients	RCT	131	^ 58.50±11.60 * 60.27	Motor function problem	^ 16.34±6.09 * 16.76±6.89	30days	Neiguan, Sanyinjiao, Shuigou, Jiquan, Chize, Weizhong, Fengchi	MAS FMA BI EMG	11	NA	yes ; physician examining the patients and carrying

				±11.71								the measurements
Zheng 2018 <sup>[50]</sup>	A clinical study on acupuncture in combination with routine rehabilitation therapy for early pain recovery of post - stroke shoulder - hand syndrome	RCT	178	45 - 70	Motor function problem	7 days - 3 months	1 month	Jianyu, Jianliao, Jianzhen, Jianneiling, Quchi, Shousanli, Hegu, Waiguan	Clinical effective rate VAS FMA FCA QOL	NA	NA	NA
Zhong 2002 <sup>[8]</sup>	Effects of acupuncture and balance facilitation of muscular tension on the early rehabilitation of patients with stroke and hemiplegia	RCT	96	NA	Balance disorder	26 - 28 days	4 weeks	Tianfu, Cize, Shaohai, Quze, Hongzhong, Ximen, Neiguan, Yuji, Shenmen, Tongli, Huantiao, Futu, Fengshi, Zusanli, Yanglingquan, Weizhong, Chengshan, Jiexi, Kunlun	FMA ADL	NA	NA	NA
Zhou 2013 <sup>[33]</sup>	Clinical research on post - stroke dysphagia treated with nape acupuncture and rehabilitation training	Quasi-RCT	80	<sup>^</sup> 57±8 * 58±7	Dysphagia	<sup>^</sup> 10.5±3.8 days * 15.1±7.7 days	4weeks	Fengchi, Yiming, Gongxue, Zhiqiang, Tunyan, Lianquan, exteriorJinjin, exteriorYuye	WDT SSA VFSS	NA	NA	NA

Zhu 2014 <sup>[51]</sup>	Clinical efficacy and sEMG analysis of a new traditional Chinese medicine therapy in the treatment of spasticity following apoplectic hemiparalysis	RCT	60	40 - 80 ^ 63.17 ±9.50 * 65.53 ±8.64	Motor function problem	^ 7.86±6.62 days * 8.46±5.14 days	4 weeks	Shaoyao Gancao Decoction: Shaoyao, Gancao	Modified Ashworth Scale Composite spasticity scale Fugl - Meyer assessment scale Barthel Index IEMG RMS	NA	1 month	NA
Zhang 2020 <sup>[52]</sup>	Clinical effect of traditional Chinese medicine acupuncture and moxibustion combined with rehabilitation training in the treatment of hemiplegia after cerebral apoplexy	RCT	60	^ 63.89 ±13.25 * 64.15 ±13.47	Motor function problem (Dependency)	NA	4 weeks	Jianliao, Binao, Liangqiu, Fengshi, Tianjing, Xuehai, Yanglingquan, Yinlingquan, Sanyinjiao	NIHSS MMT FMA ADL WHOQOL - BREF	NA	NA	NA

Teng 2019 <sup>[21]</sup>	Effect of Peiyuan Xiaoshuan Jieyu prescription and brain protein hydrolysate on the levels of monoamine neurotransmitters in cerebrospinal fluid and serum 5 - hydroxytryptamine , brain - derived neurotrophic factor and apolipoprotein A1 in post - stroke depression patients with kidney deficiency and liver stagnation type	RCT	94	$\wedge$ 62.4 $\pm$ 5.8 *	Depression	$\wedge$ 8.7 $\pm$ 3.8 months * 9.1 $\pm$ 3.5 months	12 weeks	Peiyuanxiaoshuanjieyu Decoction: Huangqi, Baishu, Tianma, Gouqizi, Shudihuang, Baishao, Suanzaoren, Fuling, Zhimu, Xiangfu, Chaihu, Yujin	TCM HAMD	NA	NA	NA
Yan 2019 <sup>[6]</sup>	Effect of western medicine combined with Chaihu plus Longgu Muli decoction in the treatment of patients with post - stroke depression	RCT	68	$\wedge$ 60.40 $\pm$ 3.42 *	Depression (Dependancy)	$\wedge$ 35.04 $\pm$ 3.82 days * 34.85 $\pm$ 3.76 days	2 months	Chaihu jialonggu muli decoction: Muli, Huangqi, Longgu, Dangcen, Chaihu, Guizhi, Fuling, Xiangfu, Zhibanxia, Zhizi, Dahuang, Gancan, Dazao	TCM HAMD NIHSS Barthel index ADL	NA	NA	NA

Fu 2019 <sup>[24]</sup>	Effect of Acupuncture plus Medication on Electroencephalogram and the Levels of Serum NE, NSE, IL - 6 and TNF - $\alpha$ in Post - stroke Depression Patients	RCT	96	62 $\pm$ 8	Depression	<sup>^</sup> 6.13 $\pm$ 1.12 months * 5.94 $\pm$ 1.07 months	4 weeks	Baihui, Shuigou, Yintang, Neiguan, Sanyinjiao	HAMD Electroencephalography	NA	NA	NA
Ye 2020 <sup>[7]</sup>	Clinical Study on Tongluo Ditan Tang Combined with Rehabilitation Training for Shoulder - Hand Syndrome After Stroke	RCT	95	<sup>^</sup> 58.89 $\pm$ 9.66 * 59.71 $\pm$ 9.38	Motor function (dependency)	<sup>^</sup> 34.67 $\pm$ 12.50 days * 33.18 $\pm$ 13.21 days	4 weeks	Tongluoditan Decoction: Huangqi, Baishao, Yanhusuo, Banxia, Fuling, Guizhi, Chuanxiong, Yujin, Qianghuo, Tiannanxing, Jiangcan, Dilong, Gancan	SHS TCM Clinical effective rate FMA VAS BI	NA	NA	NA
Jiang 2020 <sup>[53]</sup>	Clinical Study of Dysphasia After Cerebral Stroke Mainly Treated with Three Tongue Needle Therapy	RCT	130	<sup>^</sup> 60 $\pm$ 10 * 60 $\pm$ 9	Dysphasia	<sup>^</sup> 16.46 $\pm$ 9.06 days * 18.97 $\pm$ 8.09 days	4 weeks	upperLianquan	HAMA HAMD sEMG	<sup>^</sup> 3 * 7	NA	NA

Li 2019a <sup>[15]</sup>	The rapeutic Effect of Acupuncture Combined with rehabilitation Training on Shoulder - hand Syndrome after Stroke: 55 Cases	RCT	110	^ 43 - 74 * 45 - 73	Motor functi on proble m	* 17 - 56 days ^ 19 - 58 days	1 month	Jianyu, Jianliao, Quchi, Waiguan, Hegu	VAS FMA SHSS Clinical effective rate	NA	NA	NA
Wang 2020 <sup>[4]</sup>	Clinical Observation of Gualou Guizhi Tang for Lower Limb Spasm After Stroke and Its Effect on Motor Function of Lower Limbs	RCT	203	^ 66.04 ±7.38 * 65.26 ±7.45	Motor Functi on	^ 36.52±9.37 days * 35.41±10.16 days	4 weeks	Gualouguizhi Decoction: Gualougen, Guizhi, Shengjiang, Baishao, Dazao, Gancao	TCM CSI FMA BI	0	NA	NA
Wang 2017 <sup>[3]</sup>	Clinical Study on Treatment of Depression After Stroke with Combination of Chinese and Western Medicine	RCT	76	^ 59.1±3.4 * 58.6±2.9	Depre ssion (Depen dency)	^ 4.1±1.7 months * 3.9±1.9 months	4 weeks	Shuganyishentongluo Decoction: Huangqi, Chaihu, Zhike, Shichangpu, Baishu, Yujin, Fuling, Danggui, Suanzaoren, Gancao	HAMD ADL Clinical effective rate	0	NA	NA
Wang 2016a <sup>[2]</sup>	Clinical efficacy of qi - tonifying and stasis - eliminating therapy in treatment of ischemic stroke patients in	RCT	125	^ 61.17 ±7.45 *	Depen dency	>= 14days	4 weeks	Qi-tonifying and stasis-eliminating decoction: Huangqi, Dilong, Chishao, Danggui,	NIHSS BI TCM	0	NA	NA



	recovery period and its influence on levels of hs - CRP , Fg and HCY			62.25 ±7.28				Fangfeng, Chuanxiong, Shuizhi, Quanxie				
Han 2018 <sup>[22]</sup>	Chaihu plus Longgu Muli Decoction combined with Fluoxetine in the Treatment of Post Stroke Depression (Ganyu Tanrao) Randomized Parallel Control Study	Quasi-RCT	94	^ 59.71 ±5.29 * 59.69 ±5.28	Depression	^ 9.24±4.83 month * 9.21±4.82 month	4 weeks	Chaihu plus Longgu Muli decoction: Muli, Longgu, Danggui, Huangqi, Dangshen, Chaihu, Guizhi, Yujin, Dilong, Dazao, Banxia, Fuling, Gancao	HAMD MESSS GQOLI-74	0	NA	NA
Jia 2017a <sup>[54]</sup>	The effect of Chinese drug for tonify qi and activate the blood on dyskinesia at recovery period after ischemic storke with syndrome of qi deficiency and blood stasis and its effect on S100βand Hcy	RCT	140	^ 64.90 ±5.34 * 64.72 ±5.30		^ 38.10±6.38 days * 38.19 ± 6.41 days	8 weeks	modified Buyanghuanwu Decoction: Huangqi, Dangcan, Chuanniuxi, Dilong, Sangjisheng, Jixueteng, Guizhi, Danggui, Chishao, Chuanxiong, Duzhong, Shenjincao, Gancao	TCM FMA BI Berg score	0	NA	NA
Xiang 2016 <sup>[32]</sup>	Therapeutic Observation of Low - frequency Electrical Stimulation plus Acupuncture for Deglutition Disorders	RCT	76	^ 53±8 * 54±8	Dysphagia	^ 21.14±4.38 days *	5.7 weeks	Neiguan, Shuigou, Sanyinjiao, Fengchi, Wangu, Yifeng	WDT Clinical effective rate	0	NA	NA

	After Cerebral Stroke					23.66±5.01 days						
Xu 2014 <sup>[55]</sup>	Efficacy assessment of treating post - stroke shoulder - hand syndrome patients of yin deficiency yang hyperactivity with blood stasis stagnation collaterals syndrome by yishen tongluo decoction	RCT	60	^ 63.15 ±8.51 * 64.23 ±7.66		^ 32.21±7.16 days * 31.18 ± 7.85 days	4 weeks	Yishenjiejing decoction: Duzhong, Tianma, Sanqi, Shanyurou, Quanaxie, Baishao	Clinical effective rate NIHSS TCM FMA	0	NA	NA
Wan 2013 <sup>[56]</sup>	Post - stroke shoulder - hand syndrome treated with acupuncture and rehabilitation: a randomized controlled trial	RCT	120	^ 60±6 * 63±6		^ 38.4±9.0 days * 33.0 ± 9.4 days	4 weeks	Taiyuan, Zusanli, Xuanzhong, Waiguan, Shousanli, Quchi, Jianpi	FMA VRS NIHSS	0	NA	NA
Xu 2016 <sup>[57]</sup>	Clinical Observation of Jin's Three - needle Acupuncture plus Rehabilitation for Post - stroke Spastic Hemiplegia	RCT	76	^ 60±10 * 65±6		^ 50.39±2.52 days * 47.75±	4 weeks	Niesanzhen, Jiquan, Chize, Neiguan, Shuqi, Yinlingquan, Sanjinjiao	NDS FMA ADL BI FCA FIM CFE	^ 2 * 3	NA	NA

						22.63 days						
Chen 2016 <sup>[58]</sup>	Efficacy Study of Acupuncture and Moxibustion on Dysphagia after Stroke	RCT	60	^ 61.63 ±10.8 7 * 60.90 ±10.5 3		^ 47.68 days * 41.63 days	4 weeks	Fengchi, Wangu, Tianzhu, Lianquan, interiorDaying, Jinjin, Yuye	WDT PRO	0	NA	NA
Tang 2016 <sup>[1]</sup>	Analysis of five Buyanghuanwu decoction combined with western medicine treatment of stroke sequela	Quasi- RCT	80	^ 63.34 ±2.26 * 63.91 ±2.58	Motor functi on proble m	^ 5.67± 0.32 months * 5.61±0. 35 months	4.3 weeks	Buyanghuanwu Decoction: Huangqi, Chuanxiong, Dangguiwei, Taoren, Dilong, Honghua	NIHSS FMA BI	0	NA	NA

**List of included studies' references**

1. Tang D, Tang Y. Analysis of five Buyanghuanwu decoction combined with western medicine treatment of stroke sequela. *Cardiovascular Disease Journal of Integrated Traditional Chinese and Western Medicine*. 2016;14:139-140.
2. Wang C. Clinical efficacy of qi-tonifying and stasis-eliminating therapy in treatment of ischemic stroke patients in recovery period and its influence on levels of hs-CRP, Fg and HCY. *Journal of Clinical Medicine in Practice*. 2016;20:28-31.
3. Wang Y. Clinical Study on Treatment of Depression After Stroke with Combination of Chinese and Western Medicine. *Acta Chinese Medicine*. 2017;32:1519-1522.
4. Wang J, Xing Y and Jiang S. Clinical observation of Gualou Guizhi Tang for lower limb spasm after stroke and its effect on motor function of lower limbs. *Journal of New Chinese Medicine*. 2020;52:28-31.
5. Xu B, Zhou WY and Zhang SJ. Observation on effect of wuling capsule in treating poststroke depression. *Chinese journal of integrated traditional and western medicine*. 2007;27:640-642.
6. Yan Q, Yang G. Effect of western medicine combined with Chaihu plus Longgu Muli decoction in the treatment of patients with post-stroke depression. *Clinical Research and Practice*. 2019;36:152-154.
7. Ye S, Yang G, Jin J, et al. Clinical Study on Tongluo Ditan Tang Combined with Rehabilitation Training for Shoulder-Hand Syndrome After Stroke. *Journal of New Chinese Medicine*. 2020;52:70-72.
8. Zhong CM, Liu QF, Jin HY, et al. Effects of acupuncture and balance facilitation of muscular tension on the early rehabilitation of patients with stroke and hemiplegia. *Chinese Journal of Clinical Rehabilitation*. 2002;6:3612-3613.
9. Li W, Ceng YH and Yu XG. Observation on therapeutic effect of acupuncture combined with medicine on mild cognition disorders in patients with post-stroke. *Chinese acupuncture & moxibustion*. 2012;32:3-7.
10. Wang HQ, Hou M, Bao CL, et al. Effects of acupuncture treatment on lower limb spasticity in patients following hemorrhagic stroke: A pilot study. *Eur Neurol*. 2019;81:5-12.
11. Wei HT, Peng T, Yang D, et al. Clinical study of acupuncture combined with rehabilitation training in the treatment of dysphagia after stroke. *Journal emergency in traditional chinese medicine*. 2015;24:1808-1810.
12. Xia JH, Xu CE, Xia WG, et al. Clinical observation of acupuncture plus rehabilitation training for post-stroke depression. *Shanghai journal of*

- acupuncture and moxibustion*. 2015;34:724-727.
13. Xia W, Zheng C, Xia J, et al. Post-stroke dysphagia treated with acupuncture of meridian differentiation: A randomized controlled trial. *Chinese acupuncture & moxibustion*. 2016;36:673-678.
  14. Cheng XK, Wang ZM, Sun L, et al. Post-stroke hand dysfunction treated with acupuncture at zhongzhu (Te 3) and waiguan (Te 5). *Chinese acupuncture & moxibustion*. 2011;31:117-120.
  15. Li Y, Li L. The therapeutic Effect of acupuncture combined with rehabilitation training on shoulder-hand syndrome after Stroke: 55 cases. *Chinese Journal of Ethnomedicine and Ethnopharmacy*. 2019;28:96-98.
  16. Wu XL, Mi ZP, Wang HS, et al. Effect of acupuncture combined physical training and relearning on stroke rehabilitation: A multi-center randomized controlled clinical study. *Chinese journal of integrated traditional and Western medicine*. 2015;35:549-554.
  17. Zhang NX, Liu GZ, Huang TQ, et al. Effect of heat-reinforcing needling combined with rehabilitation training on the motor function of ischemic stroke patients. *Acupuncture research*. 2009;34:406-409.
  18. Zhao JG, Cao CH, Liu CZ, et al. Effect of acupuncture treatment on spastic states of stroke patients. *J Neurol Sci*. 2009;276:143-147.
  19. Fu JL, Zhao YW and Sun XJ. Efficacy and safety of deanxit combined with wuling capsule in treating post-stroke depression: A randomized controlled trial. *Journal of Chinese integrative medicine*. 2008;6:258-261.
  20. Li TG. 85 cases of depression due to stroke treated with therapy of integrated traditional chinese and western medicine. *Henan traditional chinese medicine*. 2015;35:535-536.
  21. Teng X, Gao L and Zhou B. Effect of Peiyuan Xiaoshuan Jieyu prescription and brain protein hydrolysate on the levels of monoamine neurotransmitters in cerebrospinal fluid and serum 5-hydroxytryptamine, brain-derived neurotrophic factor and apolipoprotein A1 in post-stroke depression patients with kidney deficiency and liver stagnation type. *Hebei J TCM*. 2019;41:397-401.
  22. Yan Q, Yang G. Effect of western medicine combined with Chaihu plus Longgu Muli decoction in the treatment of patients with post-stroke depression. *Clinical Research and Practice*. 2019;36:152-154.
  23. Chen A, Gao Y, Wang G, et al. Effect of early acupuncture intervention on post-stroke depression: A randomized controlled trial. *Chinese acupuncture & moxibustion*. 2018;38:1141-1144.
  24. Fu W. Effect of Acupuncture plus Medication on Electroencephalogram and the Levels of Serum NE, NSE, IL-6 and TNF- $\alpha$  in Post-stroke Depression Patients. *Shanghai J Acu-mox*. 2019;38:1214-1218.

25. Nie RR, Huang CH. Post-stroke depression treated with acupuncture and moxibustion: An evaluation of therapeutic effect and safety. *Chinese acupuncture & moxibustion*. 2013;33:490-494.
26. Wu JR, Yang JC and Nie J. 30 case of depression of post stroke with treatment kaiyu ditan decoction. *Journal of jiangxi university of traditional chinese medicine*. 2015;27:50-54.
27. Yang J, Wang F and Xiao W-H. Clinical observation on the treatment with acupuncture combined with medicine on 33 cases with depression after apoplexy. *Journal emergency in traditional chinese medicine*. 2015;24:1227-1228.
28. Fan CF, Jiang HY and Wu LZ. Clinical observations on acupuncture treatment of post-stroke dysphagia. *Journal of Acupuncture and Tuina Science*. 2007;5:297-300.
29. Li XZ, Gu BL, Zhou H, et al. Influence of nape acupuncture therapy on swallowing function of patients with cerebral infarction. *Medical Journal of Chinese People's Liberation Army* 2019;44:322-326.
30. Lu M, Meng L and Peng J. Therapeutic effects of neuromuscular electrical stimulation and electroacupuncture for dysphagia post stroke. *Chinese journal of rehabilitation medicine*. 2010;25:135-138.
31. Wang ZJ, Zhang Y, Ji QC, et al. The study of acupuncture and swallowing training in the treatment of dysphagia after stroke. *China and foreign medical treatment*. 2016;36:174-176.
32. Xiang L, Liu X, Xu Z. Therapeutic Observation of Low-frequency Electrical Stimulation plus Acupuncture for Deglutition Disorders After Cerebral Stroke. *Shanghai J Acu-mox*. 2016;35:1417-1419.
33. Zhou XM, Li XZ and Gu BL. Clinical research on post-stroke dysphagia treated with nape acupuncture and rehabilitation training. *Chinese acupuncture & moxibustion*. 2013;33:587-590.
34. Chu J, Liu X, Chen F, et al. Effects of gao's neck acupuncture on swallowing function and quality of life in patients with post-stroke pseudobulbar palsy: A randomized controlled trial. *Chinese acupuncture & moxibustion*. 2017;37:691-695.
35. Bai YL, Li L, Hu YS, et al. Prospective, randomized controlled trial of physiotherapy and acupuncture on motor function and daily activities in patients with ischemic stroke. *J Altern Complement Med*. 2013;19(8):684-689.
36. Xia W, Zheng C, Zhu S, et al. Combination of feeding-swallowing training and acupuncture: An effective rehabilitation method for dysphagia post stroke. *Acta Med Univ Sci Technol Huazhong*. 2010;39:614-619.
37. Guan CX, Guo GH and Yu L. Therapeutic effect of acupuncture plus deglutition training on patients with dysphagia caused by brainstem

- stroke. *Journal of medical forum*. 2009;30:19-23.
38. Jia C, Zhang H, Ni G, et al. Spasmodic hemiplegia after stroke treated with scalp acupuncture, music therapy and rehabilitation: A randomized controlled trial. *Chinese acupuncture & moxibustion*. 2017;37:1271-1275.
39. Li Z, Liu F, Luo B, et al. Clinical observation on auricular magnetotherapy for convalescent stroke patients with depression. *Chinese acupuncture & moxibustion*. 2018;38:942-947.
40. Ma FX, Cao GP and Li WL. Post-stroke dysphagia treated with acupoint injection combined with neural electrical stimulation. *Chinese acupuncture & moxibustion*. 2014;34:1169-1173.
41. Magnusson M, Johansson K and Johansson BB. Sensory stimulation promotes normalization of postural control after stroke. *Stroke*. 1994;25:1176-1180.
42. Wang M, Liu S, Peng Z, et al. Effect of Tui Na on upper limb spasticity after stroke: a randomized clinical trial. *Ann Clin Transl Neurol*. 2019;6(4):778-787.
43. Wei YX, Zhao X and Zhang BC. Synergistic effect of moxibustion and rehabilitation training in functional recovery of post-stroke spastic hemiplegia. *Complement Ther Med*. 2016;26:55-60.
44. Wong AM, Su TY, Tang FT, et al. Clinical trial of electrical acupuncture on hemiplegic stroke patients. *Am J Phys Med Rehabil*. 1999;78(2):117-122.
45. Xia W, Zheng C, Zhu S, et al. Does the addition of specific acupuncture to standard swallowing training improve outcomes in patients with dysphagia after stroke? a randomized controlled trial. *Clin Rehabil*. 2016;30(3):237-246.
46. Yan HD, Yang N, Zhao MH, et al. Therapeutic Observation of Thunder-fire Moxibustion at Dazhui (GV14) and Shenshu (BL23) plus Cognitive Training for Mild Cognitive Impairment Due to Ischemic Cerebral Stroke. *Shanghai Journal of Acupuncture and Moxibustion*. 2016;12:1410-1413.
47. Zeng YH, Bao Y, Zhu M, et al. Clinical study on acupuncture for ambulation disturbance in subacute stage of cerebral stroke. *Shanghai journal of acupuncture and moxibustion*. 2016;35:262-265.
48. Zhang HY, Li PF. Observation on efficacy of acupuncture combined with rehabilitation training for post-stroke balance disorders. *World Journal of Acupuncture - Moxibustion*. 2014;24:25-29.
49. Zhang Y, Al-Aref R, Fu H, et al. Neuronavigation-Assisted Aspiration and Electro-Acupuncture for Hypertensive Putaminal Hemorrhage: A



- Suitable Technique on Hemiplegia Rehabilitation. *Turk Neurosurg*. 2017;27(4):500-508.
50. Zheng J, Wu Q, Wang L, et al. A clinical study on acupuncture in combination with routine rehabilitation therapy for early pain recovery of post-stroke shoulder-hand syndrome. *Exp Ther Med*. 2018;15:2049-2053.
51. Zhu W, Zheng G, Gu Y, et al. Clinical efficacy and sEMG analysis of a new traditional Chinese medicine therapy in the treatment of spasticity following apoplectic hemiparalysis. *Acta Neurol Belg*. 2014;114(2):125-129.
52. Zhang J, Zheng W. Clinical effect of traditional Chinese medicine acupuncture and moxibustion combined with rehabilitation training in the treatment of hemiplegia after cerebral apoplexy. *China Modern Medicine*. 2020;27:155-158.
53. Jiang Y, Lin L, You Y, et al. Clinical Study of Dysphasia After Cerebral Stroke Mainly Treated with Three Tongue Needle Therapy. *Shanghai J Acu-mox*. 2020;39:530-535.
54. Jia L, Zhang J, Wang G, et al. The effect of Chinese drug for tonify qi and activate the blood on dyskinesia at recovery period after ischemic storke with syndrome of qi deficiency and blood stasis and its effect on S100 $\beta$ and Hcy. *Modern Journal of Integrated Traditional Chinese and Western Medicine*. 2017;32:3551-3554.
55. Xu X, Ye S. Efficacy assessment of treating post-stroke shoulder-hand syndrome patients of yin deficiency yang hyperactivity with blood stasis stagnation collaterals syndrome by yishen tongluo decoction. *Chinese journal of integrated traditional and Western medicine*. 2014;34:1069-1073.
56. Wan WR, Wang TL, Cheng SL, et al. Post-stroke shoulder-hand syndrome treated with acupuncture and rehabilitation: a randomized controlled trial. *Chinese acupuncture & moxibustion*. 2013;33:970-974.
57. Xu S, Gu J. Clinical Observation of Jin's Three-needle Acupuncture plus Rehabilitation for Post-stroke Spastic Hemiplegia. *Shanghai J Acu-mox*. 2016;35:153-156.
58. Chen L, Zhang G. Efficacy Study of Acupuncture and Moxibustion on Dysphagia after Stroke. *Journal of Emergency in Traditional Chinese Medicine*. 2016;25:1111-1113.