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Acupuncture for stroke rehabilitation (Review)

Yang A, Wu HM, Tang JL, Xu L, Yang M, Liu GJ

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[Intervention Review]

Acupuncture for stroke rehabilitation

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ABSTRACT

Background

Stroke is the second most common cause of death in the world and in China it has now become the main cause of death. It is also a main cause of adult disability and dependency. Acupuncture for stroke has been used in China for hundreds of years and is increasingly practiced in some Western countries. This is an update of the Cochrane review originally published in 2006 .

Objectives

To determine the efficacy and safety of acupuncture therapy in people with subacute and chronic stroke. We intended to test the following hypotheses: 1) acupuncture can reduce the risk of death or dependency in people with subacute and chronic stroke at the end of treatment and at follow-up; 2) acupuncture can improve neurological deficit and quality of life after treatment and at the end of follow-up; 3) acupuncture can reduce the number of people requiring institutional care; and 4) acupuncture is not associated with any intolerable adverse effects.

Search methods

We searched the Cochrane Stroke Group Trials Register (June 2015), the Cochrane Central Register of Controlled Trials (CENTRAL; *Cochrane Library* 2015, Issue 7), MEDLINE (1966 to July 2015, Ovid), EMBASE (1980 to July 2015, Ovid), CINAHL (1982 to July 2015, EBSCO), and AMED (1985 to July 2015, Ovid). We also searched the following four Chinese medical databases: China Biological Medicine Database (July 2015); Chinese Science and Technique Journals Database (July 2015); China National Infrastructure (July 2015), and Wan Fang database (July 2015).

Selection criteria

Truly randomised unconfounded clinical trials among people with ischaemic or haemorrhagic stroke, in the subacute or chronic stage, comparing acupuncture involving needling with placebo acupuncture, sham acupuncture, or no acupuncture.

Data collection and analysis

Two review authors independently selected trials for inclusion, assessed quality, extracted and cross-checked the data.

Main results

We included 31 trials with a total of 2257 participants in the subacute or chronic stages of stroke. The methodological quality of most of the included trials was not high. The quality of evidence for the main outcomes was low or very low based on the assessment by the system of Grades of Recommendation, Assessment, Development and Evaluation (GRADE).

Two trials compared real acupuncture plus baseline treatment with sham acupuncture plus baseline treatment. There was no evidence of differences in the changes of motor function and quality of life between real acupuncture and sham acupuncture for people with stroke in the convalescent stage.

Twenty-nine trials compared acupuncture plus baseline treatment versus baseline treatment alone. Compared with no acupuncture, for people with stroke in the convalescent phase, acupuncture had beneficial effects on the improvement of dependency (activity of daily living) measured by Barthel Index (nine trials, 616 participants; mean difference (MD) 9.19, 95% confidence interval (CI) 4.34 to 14.05; GRADE very low), global neurological deficiency (seven trials, 543 participants; odds ratio (OR) 3.89, 95% CI 1.78 to 8.49; GRADE low), and specific neurological impairments including motor function measured by Fugl-Meyer Assessment (four trials, 245 participants; MD 6.16, 95% CI 4.20 to 8.11; GRADE low), cognitive function measured by the Mini-Mental State Examination (five trials, 278 participants; MD 2.54, 95% CI 0.03 to 5.05; GRADE very low), depression measured by the Hamilton Depression Scale (six trials, 552 participants; MD -2.58, 95% CI -3.28 to -1.87; GRADE very low), swallowing function measured by drinking test (two trials, 200 participants; MD -1.11, 95% CI -2.08 to -0.14; GRADE very low), and pain measured by the Visual Analogue Scale (two trials, 118 participants; MD -2.88, 95% CI -3.68 to -2.09; GRADE low). Sickness caused by acupuncture and intolerance of pain at acupoints were reported in a few participants with stroke in the acupuncture groups. No data on death, the proportion of people requiring institutional care or requiring extensive family support, and all-cause mortality were available in all included trials.

Authors' conclusions

From the available evidence, acupuncture may have beneficial effects on improving dependency, global neurological deficiency, and some specific neurological impairments for people with stroke in the convalescent stage, with no obvious serious adverse events. However, most included trials were of inadequate quality and size. There is, therefore, inadequate evidence to draw any conclusions about its routine use. Rigorously designed, randomised, multi-centre, large sample trials of acupuncture for stroke are needed to further assess its effects.

PLAIN LANGUAGE SUMMARY

Acupuncture for stroke rehabilitation

Review question

Acupuncture is a treatment based on ancient Chinese medicine in which fine needles or pressure is applied at certain sites in the body for therapeutic purposes. We wanted to know whether acupuncture is effective in improving the recovery of daily activities, movement, and quality of life in people who had experienced a stroke more than one month previously.

Background

Stroke is a major cause of death in the world and can also cause severe disability. Acupuncture is a relatively simple, inexpensive and safe treatment that has been used in China for hundreds of years and is increasingly practiced in some Western countries. However, it remains uncertain whether the existing evidence is sufficiently reliable to recommend the routine use of acupuncture.

Study characteristics

We identified 31 studies to July 2015 for inclusion in the review. These included a total of 2257 participants who had had a stroke more than one month previously. They all investigated acupuncture aimed at promoting recovery compared with no acupuncture or sham acupuncture. Outcomes included measures of daily activities (activities of daily living), neurological function, movement, cognition, depression, swallowing, pain, and quality of life. Most of the studies (29/31) were conducted in China; the studies varied considerably with respect to the time of stroke, specific techniques used, and the frequency of acupuncture.

Key results

We found some evidence that acupuncture improved activities of daily living and a number of aspects of neurological function. However, these conclusions were based on studies with low quality evidence. No serious side effects were reported and there was no information on the effects of acupuncture on death or the need for institutional care.

Quality of the evidence

It proved difficult to reliably determine the quality of the evidence because of poor reporting of study characteristics. Therefore, we have described most conclusions as having low or very low quality evidence.

SUMMARY OF FINDINGS

Summary of findings for the main comparison.

Acupuncture + baseline treatment versus baseline treatment alone

Patient or population: adults with stroke

Settings: inpatients
Intervention: Acupuncture + baseline treatment
Comparison: baseline treatment

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Quality of the evidence (GRADE)	Comments
	Risk with baseline treatment	Risk with Acupuncture + baseline treatment				
Improvement of dependency at the end of treatment assessed with Barthel Index	The mean improvement of dependency at the end of treatment was 0	The mean improvement of dependency at the end of treatment in the intervention group was 9.19 undefined more (4.34 more to 14.05 more)	-	616 (9 RCTs)	⊕⊝⊝⊝ VERY LOW[1,2]	Substantial heterogeneity in results. Most studies were at high or unclear risk of bias. All of the studies were carried out in China
Improvement of global neurological deficit at the end of treatment assessed with Modified Edinburgh and Scandinavian Stroke Scale	The mean improvement of global neurological deficit at the end of treatment was 0	The mean improvement of global neurological deficit at the end of treatment in the intervention group was 2.39 undefined fewer (3.34 fewer to 1.43 fewer)	-	240 (4 RCTs)	⊕⊕⊝⊝ LOW[1]	Most studies were at high or unclear risk of bias. All of the studies were carried out in China
Improvement of global neurological deficit at the end of treatment	Study population		OR 3.89 (1.78 to 8.49)	543 (7 RCTs)	⊕⊕⊝⊝ LOW[1]	Most studies were at high or unclear risk of bias. All of the studies were carried out in China
	674 per 1000	890 per 1000 (787 to 946)				
	Moderate					
	733 per 1000	914 per 1000				

		(830 to 959)				
Improvement of motor function at the end of treatment - upper and lower extremities motor function (FMA) assessed with Fugl-Meyer Assessment	The mean improvement of motor function at the end of treatment - upper and lower extremities motor function was 0	The mean improvement of motor function at the end of treatment - upper and lower extremities motor function in the intervention group was 6.16 undefined more (4.2 more to 8.11 more)	-	245 (4 RCTs)	⊕⊕⊖⊖ LOW[1]	Most studies were at high or unclear risk of bias. All of the studies were carried out in China
Improvement of motor function at the end of treatment - general motor function assessed with Motor assessment scale	The mean improvement of motor function at the end of treatment - general motor function was 0	The mean improvement of motor function at the end of treatment - general motor function in the intervention group was 4.53 undefined more (2.99 more to 6.07 more)	-	60 (1 RCT)	⊕⊕⊖⊖ LOW[1]	
Improvment of general motor function at the end of follow up assessed with Fugl-Meyer Assessment follow-up: mean 3 months	The mean improvement of general motor function at the end of follow-up was 0	The mean improvement of general motor function at the end of follow-up in the intervention group was 7.59 more (0.98 more to 14.2 more)	-	(1 RCT)	⊕⊕⊕⊖ MODERATE[3]	
Improvement of motor function at the end of treatment assessed with Fugl-Meyer Assessment	Study population		OR 2.41 (0.98 to 5.96)	125 (2 RCTs)	⊕⊕⊖⊖ LOW[1]	
	710 per 1000	855 per 1000 (705 to 936)				
	Moderate					
	720 per 1000	861 per 1000 (716 to 939)				
Improvement of cognitive function at the end of treatment assessed with Mini-mental state examination	The mean improvement of cognitive function at the end of treatment was 0	The mean improvement of cognitive function at the end of treatment in the intervention group was 2.54 undefined more (0.03 more to 5.05 more)	-	278 (5 RCTs)	⊕⊖⊖⊖ VERY LOW[1,2]	Substantial heterogeneity in results. Most studies were at high or unclear risk of bias. All of the studies were carried out in China

Improvment of cognitive function at the end of follow-up assessed with Mini-mental state examination follow-up: 1 month	The mean improvement of cognitive function at the end of follow up was 0	The mean improvement of cognitive function at the end of follow-up in the intervention group was 3.47 undefined more (2.43 more to 4.51 more)	-	71 (1 RCT)	⊕⊕⊖⊖ LOW[1]	
Improvement of cognitive function at the end of treatment assessed with: Mini-mental state examination	Study population		OR 3.82 (1.89 to 7.72)	166 (3 RCTs)	⊕⊕⊖⊖ LOW[1]	
	512 per 1000	800 per 1000 (665 to 890)				
	Moderate					
	533 per 1000	814 per 1000 (684 to 898)				
Improvement of depression at the end of treatment assessed with Hamilton Depression Scale	The mean improvement of depression at the end of treatment was 0	The mean improvement of depression at the end of treatment in the intervention group was 2.58 undefined fewer (3.28 fewer to 1.87 fewer)	-	552 (6 RCTs)	⊕⊖⊖⊖ VERY LOW[1,2]	Substantial heterogeneity in results. Most studies were at high or unclear risk of bias. All of the studies were carried out in China
Improvement of depression at the end of treatment assessed with Hamilton Depression Scale	Study population		OR 2.03 (1.10 to 3.72)	342 (4 RCTs)	⊕⊕⊖⊖ LOW[1]	Most studies were at high or unclear risk of bias. All of the studies were carried out in China
	784 per 1000	880 per 1000 (799 to 931)				
	Moderate					
	807 per 1000	894 per 1000 (821 to 939)				
Improvement of swallowing function at the end of treatment	The mean improvement of swallowing function at the end of treatment was 0	The mean improvement of swallowing function at the end of treatment in the intervention group was 1.11 undefined fewer (2.08 fewer to 0.14 fewer)	-	200 (2 RCTs)	⊕⊖⊖⊖ VERY LOW[1,2]	

Improvement of pain at the end of treatment assessed with Visual Analogue Scale	The mean improvement of pain at the end of treatment was 0	The mean improvement of pain at the end of treatment in the intervention group was 2.88 undefined fewer (3.68 fewer to 2.09 fewer)	-	118 (2 RCTs)	⊕⊕⊖⊖ LOW[1]
Improvement of sleep quality at the end of treatment assessed with Rhone Planck Sleepiness Scale	The mean improvement of sleep quality at the end of treatment was 0	The mean improvement of sleep quality at the end of treatment in the intervention group was 1.09 undefined fewer (2.37 fewer to 0.19 more)	-	60 (1 RCT)	⊕⊕⊕⊖ MODERATE[3]
Improvement of spasticity at the end of treatment assessed with Modified Ashworth Spasticity Rating Scale	The mean improvement of spasticity at the end of treatment was 0	The mean improvement of spasticity at the end of treatment in the intervention group was 0.4 undefined fewer (0.64 fewer to 0.16 fewer)	-	60 (1 RCT)	⊕⊕⊖⊖ LOW[1]
Improvement of quality of life at the end of treatment assessed with MOS SF-36	The mean improvement of quality of life was 0	The mean improvement of quality of life in the intervention group was 2.73 undefined more (0.54 fewer to 6 more)	-	71 (1 RCT)	⊕⊕⊖⊖ LOW[1]

*__The risk in the intervention group__ (and its 95% confidence interval) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio; **OR:** Odds ratio;

GRADE Working Group grades of evidence
High quality: We are very confident that the true effect lies close to that of the estimate of the effect
Moderate quality: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low quality: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect
Very low quality: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

[1] Downgraded by two levels for very serious risk of bias (none of the trials used adequate allocation concealment, nor blinding of participants or researchers. Also, most of them were at risk of attrition bias).
[2] Downgraded by one level for serious inconsistency (due to substantial heterogeneity, $I^2 = 57\%$).
[3] Downgraded by one level for this trial did not use blinding of participants or researchers.

BACKGROUND

Description of the condition

Stroke is the second leading cause of death in the world (GBD2013 2015). In the USA, stroke accounted for about one of every 19 deaths in 2010. On average, someone dies of stroke every four minutes (Go 2014). In 2013, stroke has become the leading cause of death in cities and rural areas in China (GBD2013 2015). Although age-standardised rates of stroke mortality have decreased worldwide in the past two decades, the absolute numbers of people with first stroke (16.9 million), stroke survivors (33 million), stroke-related deaths (5.9 million), and disability-adjusted life-years (DALYs) lost (102 million) in 2010 were still high and had significantly increased since 1990 (68%, 84%, 26%, and 12% increase, respectively), imposing a great burden on families and communities in low-income and middle-income countries (Feigin 2014). Despite considerable research efforts on multiple treatment modalities, there is still no single rehabilitation intervention demonstrated unequivocally to aid recovery. This reality drives people to search for other modalities of treatment in an attempt to further improve the outcome of stroke rehabilitation, such as acupuncture and Chinese herbal medicine.

Description of the intervention

Acupuncture is one of the main modalities of treatment in traditional Chinese medicine and can be traced back more than 3000 years in China (Wu 1996). Being a relatively simple, inexpensive, and safe treatment compared with other conventional interventions, acupuncture has been well accepted by Chinese patients and is widely used to improve motor, sensation, speech, and other neurological functions in people with stroke. As a therapeutic intervention, acupuncture is also increasingly practiced in some Western countries (Hegyi 2012; Johansson 1993; NIH 1998; Salom-Moreno 2014; Schaechter 2007; Wayne 2005). .

How the intervention might work

Many studies in animals and humans have demonstrated that acupuncture can cause multiple biological responses, including circulatory and biochemical effects. These responses can occur locally or close to the site of application, or at a distance. They are mediated mainly by sensory neurons to many structures within the central nervous system. This can lead to activation of pathways affecting various physiological systems in the brain as well as in the periphery (Jansen 1989; Johansson 1993; Magnusson 1994; Sun 2001; Wang 2001). In summary, possible mechanisms of the effects of acupuncture on neurological conditions include stimulation of neuronal cell proliferation (Cheng 2008), facilitation of neural plasticity (Ren 2008), reduction of the post-ischaemic inflammatory reaction (Liu 2009a), and prevention of neuronal apoptosis (Zhang 2008a).

Why it is important to do this review

There are a large number of studies of the clinical efficacy of acupuncture in stroke rehabilitation published in the world, especially in China, but not all demonstrate a beneficial effect on stroke rehabilitation (Hu 1993; Johansson 2001; Sun 2001; Sze 2002; Zhan 2014; Zhang 1996; Zhang 2015). Many systematic reviews of trials of acupuncture in stroke rehabilitation have been conducted (Ernst 1996; Hopwood 1996; Kong 2010; Li 2014; Park 2001; Smith 2002; Sze 2002; Wu 2010a). These reviews, however, included mainly trials with stroke patients in either the acute, or subacute, and chronic stages. Some reviews only focused on specific types of stroke (Liu 2005; Wang 2012a; Zheng 2011a), or needling (Dong 2013; Kim 2010; Zhou 2013), or neurologic deficits (Lim 2015; Long 2012; Liu 2014a; Park 2014; Qi 2009; Wong 2012; Zhang 2009a; Zhang 2012a; Zhang 2014a; Zhu 2011a). Knowing that a large number of clinical studies had been completed since this review was originally published in 2006 (Wu 2006), we aimed to conduct an up-to-date systematic review of publications regardless of subtype of stroke, or needling, or neurologic deficits.

The aim of this review was to systematically analyse all the randomised controlled trials of acupuncture for subacute and chronic stroke to provide the best available evidence to inform clinical practice and further research planning on stroke treatment.

OBJECTIVES

To determine the efficacy and safety of acupuncture therapy in people with subacute and chronic stroke. We intended to test the following hypotheses: 1) acupuncture can reduce the risk of death or dependency in people with subacute and chronic stroke at the end of treatment and at follow-up; 2) acupuncture can improve neurological deficit and quality of life after treatment and at the end of follow-up; 3) acupuncture can reduce the number of people requiring institutional care; and 4) acupuncture is not associated with any intolerable adverse effects.

METHODS

Criteria for considering studies for this review

Types of studies

In the review, we included randomised controlled clinical trials (RCTs) comparing acupuncture with at least one control group that used placebo, sham treatment, or conventional treatment in people with subacute (one to three months since onset) or chronic stroke (over three months since onset). We excluded trials using quasi-randomisation or the allocation of participants using alternation, case record numbers, dates of birth, day of the week, or controlled trials using any other non-random allocation methods.

Types of participants

Trials involving participants of any age or sex with ischaemic or haemorrhagic stroke in the subacute (one to three months since onset) or chronic phases (over three months since onset) were eligible. Stroke must have been diagnosed according to the World Health Organization definition (rapidly developed clinical signs of focal (or global) disturbances of cerebral function, lasting more than 24 hours or leading to death, with no other apparent cause than of vascular origin (Asplund 1988)), or confirmed by computerised tomography (CT), or magnetic resonance imaging (MRI). We did not include trials of participants with subarachnoid haemorrhage or subdural haematoma. We also excluded trials that included people in the acute phase of stroke (within one month since onset).

Types of interventions

We included trials evaluating acupuncture therapy that involved needling after stroke onset at the subacute or chronic phases, regardless of times of treatment or length of treatment period. We included either traditional acupuncture, in which the needles

were inserted in classical meridian points, or contemporary acupuncture, in which the needles were inserted in non-meridian or trigger points, regardless of the source of stimulation (for example, hand or electrical stimulation). We excluded trials in which the acupuncture treatment did not involve needling, such as acupressure or laser acupuncture.

The control interventions were placebo acupuncture, sham acupuncture, or other conventional treatment. Placebo acupuncture refers to a needle attached to the skin surface (not penetrating the skin but at the same acupoints) (Van Tulder 2000). Sham acupuncture refers to:

1. a needle placed in an area close to but not in the acupuncture points (Van Tulder 2000);
2. subliminal skin electrostimulation via electrodes attached to the skin (SCSSS 1999).

The comparisons we investigated were:

1. acupuncture only compared with placebo or sham treatment;
2. acupuncture in addition to baseline medication or treatment compared with placebo or sham treatment in addition to baseline medication or treatment;
3. acupuncture in addition to baseline medication or treatment compared with baseline medication or treatment alone.

We excluded trials that compared different forms of acupuncture only and we also excluded trials reporting only physiological or laboratory parameters.

Types of outcome measures

We included trials that used at least one of the following outcome measures.

Primary outcomes

Death or dependency at the end of follow-up (at least three months or longer after stroke onset). We defined dependency as dependent on others in activities of daily living, based on the correlated definition of the Barthel scores (Activities of Daily Living, ADL) as a score of less than 60 or an Oxford handicap grade 3 to 6 (Sulter 1999), or the trialists' own definition.

Secondary outcomes

1. The proportion of people requiring institutional care or requiring extensive family support at the end of follow-up (at three months or longer after stroke onset). Family care is the main form of care for severely dependent people in developing countries.
2. Changes of neurological deficit after acupuncture treatment and at the end of follow-up (at three months or longer after stroke onset). The measures could focus on specific impairment (for example, Motricity Index, or Motor Assessment Scale, which assess only motor function), or global neurological deficit (for example, the National Institute of Health Stroke Scale, European Stroke Scale, the Scandinavian Stroke Scale) or two kinds of Chinese Stroke Recovery Scales, which involve motor, sensory and other impaired neurological functions. The Chinese Stroke Recovery Scale 1 (CSRS 1) refers to "the Revised Diagnostic Criteria of Acute Cerebral Infarction" formulated by the second National Academic Symposium on Cerebrovascular Diseases of the Chinese Medical Association in 1986, which is similar to the Revised Scandinavian Stroke Scale (RSSS). The Chinese Stroke Recovery Scale 2 (CSRS 2) refers to "the Chinese Stroke Recovery Scale based on principles of traditional Chinese medicine".
3. Death from any causes during the entire treatment and follow-up period.
4. Quality of life (QOL) at the end of follow-up (at three months or longer after stroke onset). This could be measured by the Nottingham Health Profiles or Spiter Quality of Life Index.
5. Possible adverse events including dizziness, difficulty in tolerating electrostimulation, infection, puncture of a lung, heart tamponades, spinal cord injury, disrupted pacemaker function; and presumed to be caused by acupuncture or electrostimulation. We evaluated the number of participants developing at least one severe adverse event listed above.

Search methods for identification of studies

See the 'Specialized register' section in the Cochrane Stroke Group module. We searched for all trials in all languages and arranged translation of relevant papers where necessary.

Electronic searches

Original searches (2005)

We initially obtained relevant trials from the following sources with no language restriction.

1. Cochrane Stroke Group Trials Register (November 2005).
2. Cochrane Central Register of Controlled Trials (CENTRAL) (*Cochrane Library 2005,* Issue 3).
3. MEDLINE (1966 to November 2005) combined with the Cochrane highly sensitive search strategy for identifying RCTs in MEDLINE (Dickersin 1994).
4. EMBASE (1980 to November 2005). Modified MEDLINE search and combined with the Cochrane highly sensitive search strategy for identifying RCTs in EMBASE (Lefebvre 1996).
5. Chinese Stroke Trials Register (November 2005).
6. Chinese Acupuncture Trials Register (November 2005).
7. Trials Register of the Cochrane Complementary Medicine Field (November 2005).
8. CINAHL (1982 to November 2005).
9. AMED (the Allied and Complementary Medicine Database, 1985 to November 2005).
10. Chinese Biological Medicine Database (CBM-disc, 1979 to November 2005).
11. National Center for Complementary and Alternative Medicine Register (http://nccam.nih.gov/clinical trials/) and National Institute of Health Clinical Trials Database (http://clinicaltrials.gov) (searched November 2005).

Review update (2015)

We searched CENTRAL and the Cochrane Stroke Group Trials Register as above for new trials. We obtained relevant new trials from the following sources with no language restriction in the updated review.

1. Cochrane Stroke Group Trials Register (June 2015; Appendix 1).
2. Cochrane Central Register of Controlled Trials (CENTRAL; 2015, Issue 7) (Appendix 2).

3. MEDLINE (July 2015; Ovid; Appendix 3).
4. EMBASE (July 2015; Ovid; Appendix 4).
5. CINAHL (July 2015; EBSCO;Appendix 5).
6. AMED (the Allied and Complementary Medicine Database, July 2015; Ovid; Appendix 6).
7. Chinese Biological Medicine Database (July 2015; Appendix 7).
8. Chinese Science and Technique Journals Database (to July 2015; Appendix 8).
9. China National Infrastructure (to July 2015; Appendix 9).
10. WanFang database (to July 2015; Appendix 10).

Searching other resources

Original searches (2005)

1. We handsearched four Chinese journals relevant to acupuncture (from 1980 to November 2005):
   a. *Acupuncture Research;*
   b. *Chinese Acupuncture and Moxibustion;*
   c. *Journal of Clinical Acupuncture and Moxibustion;*
   d. *Shanghai Journal of Acupuncture and Moxibustion.*
2. We checked the reference lists of all relevant papers identified, including two systematic reviews (Park 2001; Sze 2002), for further published and unpublished trials.

Review update (2015)

We searched the reference lists of all relevant papers identified.

Data collection and analysis

Selection of studies

Two review authors (AY, LX) independently checked the titles and abstracts of trials for inclusion based on the selection criteria outlined above. We retrieved the full text of the article if there was any doubt whether the article should be excluded or not. In cases of disagreement between the two review authors, a third member of the stroke research group (JLT or HMW) reviewed the information to decide on inclusion or exclusion of an article.

Data extraction and management

Two review authors (AY, L) independently extracted information on participants, methods, interventions, outcomes, and results by using a self-developed data extraction form. We translated studies not in English or Chinese before assessment. Where more than one publication for a study existed, we grouped reports together and we used the publication with the most complete data. Where relevant outcomes were only published in earlier versions, we used these data. We resolved disagreements by involving a third review author (JLT or HMW) or through discussion.

Assessment of risk of bias in included studies

We assessed the following items using the Cochrane risk of bias assessment tool (Higgins 2011a; Appendix 11).

1. Was there adequate sequence generation?
2. Was allocation adequately concealed?
3. Was knowledge of the allocated interventions adequately prevented during the study?
4. Were incomplete outcome data adequately addressed?
5. Are reports of the study free of suggestion of selective outcome reporting?
6. Was the study apparently free of other problems that could put it at a risk of bias?

Two review authors (AY, LX) independently assessed risk of bias; any disagreements were resolved by a third review author (JLT or HMW).

Measures of treatment effect

For dichotomous outcomes (e.g. death or dependency, adverse effects), we expressed the results as odds ratios (ORs) with 95% confidence intervals (CIs). For continuous outcomes (e.g. quality of life), we used the mean difference (MD), or the standardised mean difference (SMD) if different scales were used.

Assessment of heterogeneity

We tested heterogeneity between trial results using a standard Chi^2 test on N-1 degrees of freedom, with a threshold value of $P < 0.1$, and with the I^2 test (Higgins 2003). I^2 values of 25%, 50% and 75% correspond to low, medium and high levels of heterogeneity.

Assessment of reporting biases

If we identified a sufficient number of studies, we planned to examine for potential publication bias using a funnel plot (Sterne 2011).

Data synthesis

We pooled data using the random-effects model but we also used the fixed-effect model to ensure robustness of the model chosen and susceptibility to outliers.

Subgroup analysis and investigation of heterogeneity

We planned to undertake subgroup analyses to explore possible sources of heterogeneity (e.g. participants, interventions, and study quality). Heterogeneity among participants could be related to the type and severity of stroke. Post-stroke neurological recovery is known to be obvious within three months, especially post-stroke motor recovery, and is unlikely beyond six months, so heterogeneity in treatments could be related to times to start of treatment. Mixing patients with interval from stroke onset of less than three months, three to six months, and more than six months in one sample would make the assessment of the efficacy of an intervention methodologically unsound. If appropriate data were available, we planned a subgroup analysis to compare participants with different times to start of treatment (within three months, three to six months, and after six months) using the method outlined by Deeks 2001.

Sensitivity analysis

If appropriate data were available, we planned a sensitivity analysis to assess the effects of including only those trials:

1. that were double blind;
2. with adequate concealment of randomisation;
3. published in a language other than Chinese.

RESULTS

Description of studies

Results of the search

2006 version

For the 2006 version of this review, we identified 6402 potentially relevant articles, retrieved 50 full-text articles, and included five trials with 368 participants (Dai 1997; Li 1997a; Lun 1999; Naeser 1992; Wang 2001).

2015 update

For the update of this review, we identified 5874 potentially relevant articles from January 2005 to July 2015. Of these, we retrieved 371 full-text articles for further assessment and included 26 trials with 1889 participants (Bao 2012; Chou 2009; Gao 2014a; Guo 2011; Guo 2012; Huang 2008a; Ke 2015; Li 2010a; Li 2011a; Li 2013a; Liu 2013a; Sun 2013a; Sun 2015; Wang 2011a; Wang 2012; Wu 2008; Wu 2011a; Wu 2013a; Xu 2013; Yao 2014; Zhan 2014; Zhang 2013a; Zhang 2015; Zheng 2014; Zhou 2014; Zhu 2007). There are four relevant ongoing studies (Fu 2011; Liu 2013b; Xie 2006; Zhong 2010; Characteristics of ongoing studies). In total, we have included 31 trials in this updated review. Results of the search are displayed in Figure 1.

Figure 1. Study flow diagram.

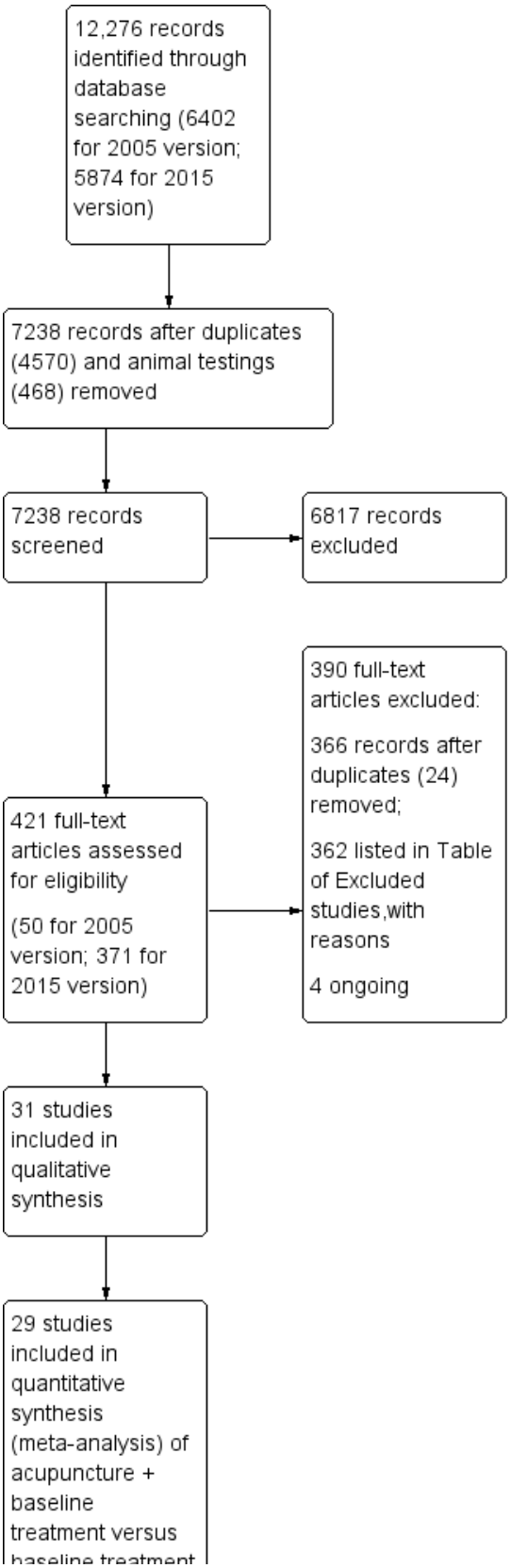
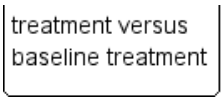


Figure 1. (Continued)



Included studies

A total of 31 trials were eligible for inclusion in this systematic review. For details of each included trial please see the Characteristics of included studies table.

Participants

Of the 31 included trials, 29 were conducted in China, one in the UK, and one in the USA.

The age of participants ranged from 24 to 95 years. More men than women were included in 23 trials (between 47% and 75% men) (Bao 2012; Dai 1997; Guo 2011; Guo 2012; Huang 2008a; Ke 2015; Li 2010a; Li 2011a; Liu 2013a; Lun 1999; Sun 2013a; Wang 2001; Wang 2011a; Wang 2012; Wu 2008; Wu 2011a; Yao 2014; Zhan 2014; Zhang 2013a; Zhang 2015; Zheng 2014; Zhou 2014; Zhu 2007). Three trials did not describe the gender of the participants (Li 1997a; Li 2013a Naeser 1992). The range of time from stroke onset was from one month to 8.5 years.

There were five trials involving participants with interval from stroke onset between one to three months (Huang 2008a; Li 2013a; Naeser 1992; Wu 2013a; Zhou 2014), 10 trials more than three months (Dai 1997; Bao 2012; Chou 2009; Gao 2014a; Guo 2012; Li 2011a; Liu 2013a; Sun 2013a; Sun 2015; Zhang 2013a), and 16 trials including participants with interval from stroke onset of either less than three months or more than three months (Guo 2011; Ke 2015; Li 1997a; Li 2010a; Lun 1999; Wang 2001; Wang 2011a; Wang 2012; Wu 2008; Wu 2011a; Xu 2013; Yao 2014; Zhan 2014; Zhang 2015; Zheng 2014; Zhu 2007).

Seven trials included participants with ischaemic stroke only (Dai 1997; Bao 2012; Huang 2008a; Naeser 1992; Wu 2011a; Zhang 2015; Zhou 2014). Five trials did not describe the type of stroke (Guo 2012; Li 2011a; Sun 2015; Xu 2013; Zhan 2014). All other trials included participants with ischaemic and haemorrhagic stroke (Chou 2009; Gao 2014a; Guo 2011; Ke 2015; Li 1997a; Li 2010a; Li 2013a; Liu 2013a; Lun 1999; Sun 2013a; Wang 2001; Wang 2011a; Wang 2012; Wu 2008; Wu 2013a; Yao 2014; Zhang 2013a; Zheng 2014; Zhu 2007). All of the included trials used CT or MRI to confirm the diagnosis of stroke. The severity on entry was mild to severe in two trials (Dai 1997; Naeser 1992), without a definition of severity or not stated in the remaining 29 trials (Bao 2012; Chou 2009; Gao 2014a; Guo 2011; Guo 2012; Huang 2008a; Ke 2015; Li 1997a; Li 2010a; Li 2011a; Li 2013a; Liu 2013a; Lun 1999; Sun 2013a; Sun 2015; Wang 2001; Wang 2011a; Wang 2012; Wu 2008; Wu 2011a; Wu 2013a; Xu 2013; Yao 2014; Zhan 2014; Zhang 2013a; Zhang 2015; Zheng 2014; Zhou 2014; Zhu 2007).

Interventions

Two trials compared real acupuncture plus baseline treatment with sham acupuncture plus baseline treatment (Chou 2009; Naeser 1992); the remaining 29 trials compared acupuncture plus baseline medication or treatment with baseline medication or treatment alone. None of the trials compared acupuncture only with placebo or sham treatment.

Among the included trials there were 10 three-armed trials (Dai 1997; Guo 2011; Huang 2008a; Li 1997a; Li 2013a; Sun 2015; Wang 2001; Wu 2013a; Zhang 2013a; Zhang 2015) and one four-armed trial (Wu 2008) comparing acupuncture plus baseline medication or treatment with baseline medication treatment alone, one kind of acupuncture with another kind of acupuncture, or acupuncture only with other treatment. In this review, the baseline medication or treatment included Western medicine (WM), traditional Chinese medicine (TCM), non-pharmacological therapy, or a combination. WM included aspirin and other conventional drug therapies.

With one exception (Chou 2009), none of the other 30 included trials reported the acupuncture rationale or acupuncturists' background, including duration of relevant training, length of clinical experience and expertise in the specific condition. The acupuncture interventions used varied considerably across trials. Nineteen trials used only manual stimulation (Bao 2012; Dai 1997; Gao 2014a; Guo 2012; Huang 2008a; Ke 2015; Li 1997a; Li 2011a; Li 2013a; Lun 1999; Wang 2001; Wang 2011a; Wang 2012; Wu 2008; Wu 2013a; Xu 2013; Zhan 2014; Zhang 2015; Zheng 2014), four used only electrical stimulation (Chou 2009; Naeser 1992; Sun 2015; Wu 2011a), and eight used the combination of manual and electrical stimulation (Guo 2011; Li 2010a; Liu 2013a; Sun 2013a; Yao 2014; Zhang 2013a; Zhou 2014; Zhu 2007). Acupuncture point prescriptions were not consistent, with 15 trials involving either scalp or body acupoints (Chou 2009; Guo 2012; Huang 2008a; Ke 2015; Li 2011a; Li 2013a; Liu 2013a; Lun 1999; Wang 2001; Wang 2011a; Wang 2012; Wu 2013a; Zhan 2014; Zhang 2013a; Zhang 2015), and 16 trials using both body and scalp acupoints (Bao 2012; Dai 1997; Gao 2014a; Guo 2011; Li 1997a; Li 2010a; Naeser 1992; Sun 2013a; Sun 2015; Wu 2008; Wu 2011a; Xu 2013; Yao 2014; Zheng 2014; Zhou 2014; Zhu 2007). Numbers of points used ranged from one to 27 points in all included trials. The needle retention time was 15 to 40 minutes in all included trials. Thirteen trials reported the achievement of 'deqi', an irradiating feeling said to indicate effective needling (Bao 2012; Chou 2009; Dai 1997; Li 2010a; Li 2011a; Liu 2013a; Lun 1999; Sun 2013a; Sun 2015; Wang 2001; Yao 2014; Zheng 2014; Zhu 2007). Information on needle type was available in 13 trials (Bao 2012; Chou 2009; Dai 1997; Li 2010a; Lun 1999; Liu 2013a; Naeser 1992; Sun 2013a; Sun 2015; Wu 2011a; Yao 2014; Zheng 2014; Zhu 2007). The length of treatment period ranged from one to 24 weeks with the number of treatment sessions varying from six to 120 sessions and the frequency of treatment from five sessions per week to two sessions per day.

Outcomes

The most commonly reported outcomes were dependency, global neurological deficit, and specific neurological impairment after acupuncture treatment. Thirteen trials evaluated the effect of acupuncture on dependency (activities of daily living) at the end of acupuncture treatment. The measures employed included the Barthel Index (BI) or modified Barthel Index (MBI) in 11 trials (Bao 2012; Huang 2008a; Ke 2015; Li 2010a; Wang 2012; Wu 2011a; Yao 2014; Zhan 2014; Zhang 2015; Zheng 2014; Zhou 2014) and the Physical Self-maintenance Scale (PSMS) combined with

Instrumental Activities of Daily Living Scale (IADL) in two trials (Li 2011a; Sun 2013a). Twelve trials measured the global neurological deficit score or the proportion of participants with an improvement of global neurological deficit at the end of acupuncture treatment (Dai 1997; Gao 2014a; Guo 2011; Huang 2008a; Li 1997a; Lun 1999; Sun 2013a; Wang 2001; Yao 2014; Zhang 2015; Zhou 2014; Zhu 2007). The measures employed included NIHSS, CSRS1 (e.g. MESSS) and CSRS2 (TCM). Six trials evaluated the effect of acupuncture on motor function measured with Fugl-Meyer scale (FMA) and Motor assessment scale after treatment (Li 2013a; Wang 2011a; Wang 2012; Wu 2011a; Yao 2014; Zhou 2014). Eighteen trials evaluated the effect of acupuncture on specific neurological impairments (e.g. cognitive function; swallowing function; depression) at the end of treatment (Bao 2012; Gao 2014a; Guo 2011; Guo 2012; Li 2010a; Li 2011a; Liu 2013a; Sun 2013a ;Sun 2015; Wang 2011a; Wu 2008; Wu 2011a; Wu 2013a; Xu 2013; Yao 2014; Zhang 2013a; Zheng 2014; Zhou 2014). Two trials reported quality of life measured with the Medical Outcomes Study 36-Item Short-Form Health Survey (MOS SF-36) (Chou 2009; Sun 2013a). Only five trials reported information on adverse events (Li 2010a; Sun 2013a; Sun 2015; Zhang 2013a; Zhou 2014). None of the 31 included trials provided any information on death, proportion of participants requiring institutional care or extensive family support after acupuncture treatment or at the end of follow-up.

Excluded studies

Of the 12,276 citations identified from English and Chinese databases, we excluded 11,855 citations during the initial screening of titles and abstracts. The main reasons for these exclusions were as follows.

1. Not stroke.
2. Studies not RCT.
3. Stroke duration since onset less than 30 days.
4. Acupuncture not involving needling: such as acupressure; laser acupuncture.
5. Studies comparing different kinds of acupuncture therapies.
6. Review articles.

We retrieved a total of 421 potentially eligible studies for screening of the full-text papers.

Of the 421 potentially eligible studies, we excluded 390 studies for the following reasons.

1. Questionable randomisation.
2. Comparing two different methods of acupuncture.
3. Stroke duration since onset less than 30 days.
4. Duplicates.
5. Others: abstract, review.

For details please see the Characteristics of excluded studies table.

Risk of bias in included studies

Please see Characteristics of included studies for details of the methodological quality, and Figure 2 and Figure 3 for summaries of the risk of bias findings in all included trials.

Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

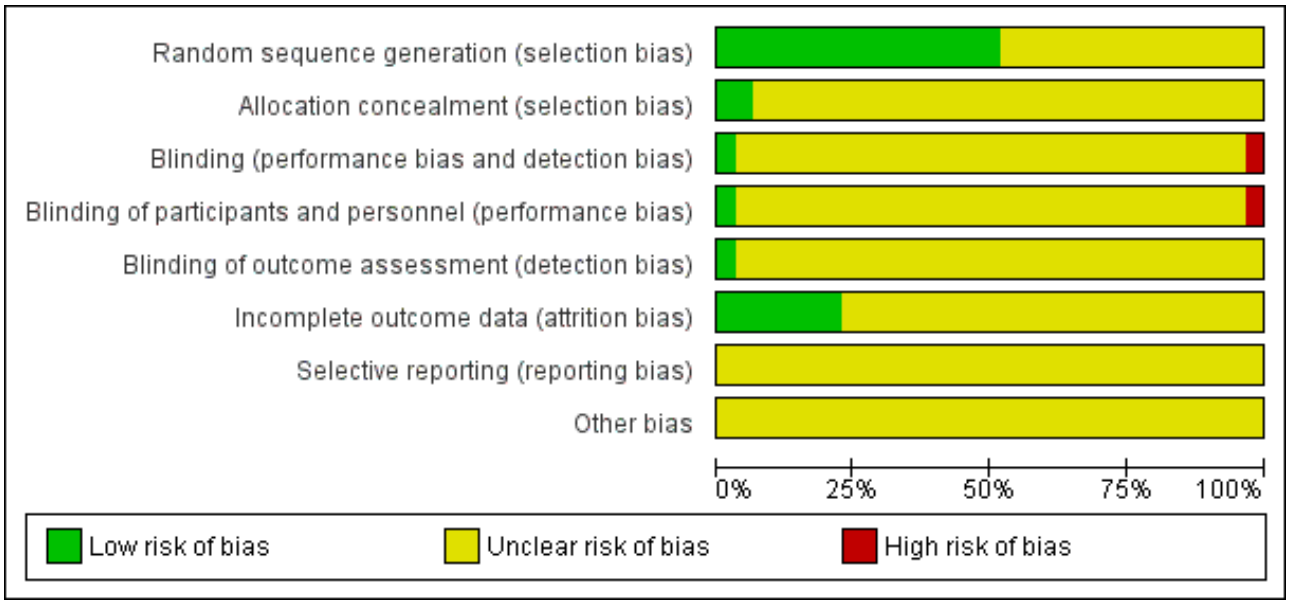


Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

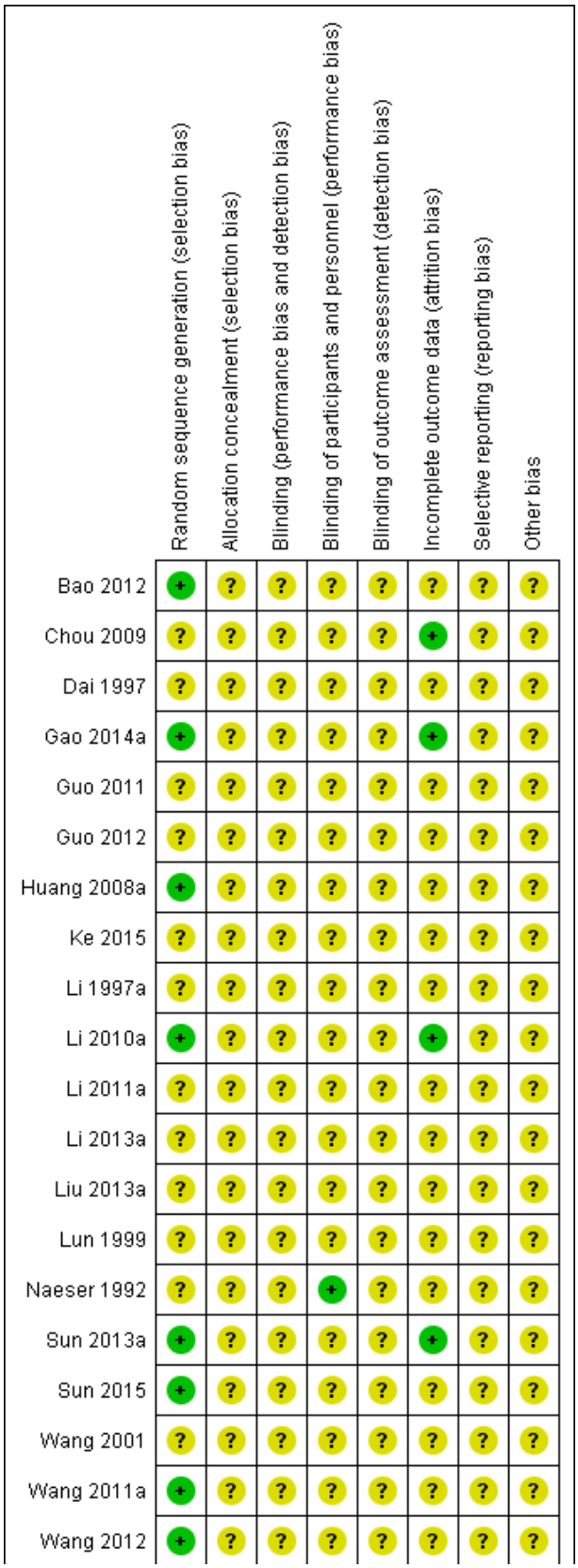
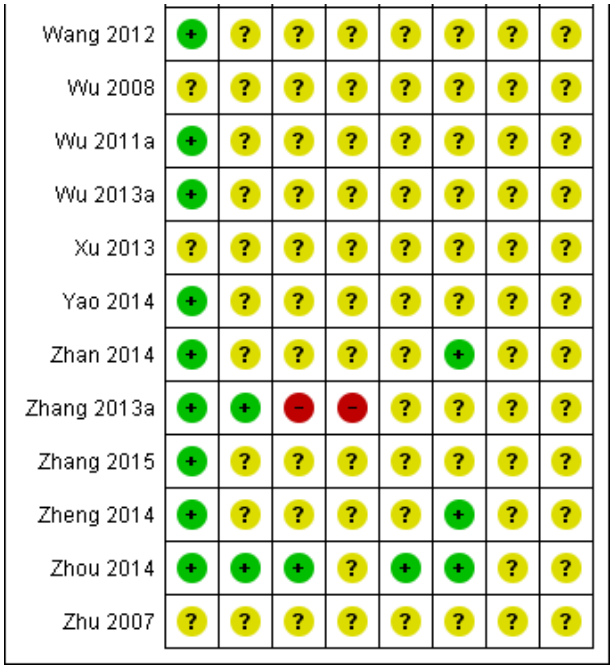


Figure 3. (Continued)



Allocation

Random sequence generation

Thirteen trials randomly assigned participants to groups by using random number tables (Bao 2012; Huang 2008a; Gao 2014a; Li 2010a; Sun 2013a; Wang 2011a; Wang 2012; Wu 2013a; Yao 2014; Wu 2011a; Zhan 2014; Zhang 2015; Zheng 2014). The remaining 18 trials did not report their methods of random sequence generation.

Allocation concealment

Of the 31 included trials, only three trials reported adequate allocation concealment by using sealed envelopes (Sun 2015; Zhang 2013a; Zhou 2014).

Blinding

Zhang 2013a reported that participants, their physicians, and outcome assessors were not blinded. Zhou 2014 reported that the investigators were blinded but the participants were not. Naeser 1992 reported that the participants were blinded without describing the method in detail. No information on blinding was available in the remaining 28 trials.

Incomplete outcome data

Seven trials reported withdrawals, but the results were not analysed on an intention-to-treat basis (Chou 2009; Gao 2014a; Li 2010a; Sun 2013a; Zhan 2014; Zheng 2014; Zhou 2014). There was no statement on dropouts or withdrawals in any of the remaining 24 trials. For each of these 24 trials, the number of participants randomised was the same as participants analysed, so it appears that there were no exclusions from the trials after randomisation. We concluded that, although the results appeared to be analysed by intention-to-treat, we cannot be certain about this.

Selective reporting

The included trials in this review did not report some clinically important outcomes, such as death, requiring Institutional care, and all-cause mortality. Of the 31 included studies, only five studies reported adverse events (Li 2010a; Sun 2013a; Sun 2015; Zhang 2013a; Zhou 2014), therefore we assumed that this may have constituted some degree of reporting bias.

Other potential sources of bias

There was insufficient information reported to determine if there were any other potential sources of bias.

Effects of interventions

See: **Summary of findings for the main comparison**

Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment

Two trials compared real acupuncture plus baseline treatment with sham acupuncture plus baseline treatment (Chou 2009; Naeser 1992).

Changes of specific neurological impairments after acupuncture treatment and at the end of follow-up

One trial with 16 participants evaluated the effect of acupuncture on the improvement of motor function after treatment by using a categorical approach rather than continuous scales (Naeser 1992). It showed that real acupuncture was not superior to sham acupuncture in the improvement of motor function for participants with stroke in the convalescent stage (OR 9.00, 95% CI 0.40 to 203.30; Analysis 1.1), but the confidence interval was very wide and included clinically significant effects in both directions.

Another trial with 33 participants evaluated the effect of acupuncture on the change of cognitive function after treatment

(Chou 2009).There were significant improvements in orientation (MD 4.21, 95% CI 1.78 to 6.64), perception (MD 5.32, 95% CI 0.93 to 9.71), and praxis (MD 3.80, 95% CI 2.12 to 5.48) among participants in the real acupuncture group compared with the sham acupuncture group, but acupuncture was not superior to control in the improvement of visuomotor organisation (MD 2.76, 95% CI -0.58 to 6.10), thinking operation (MD 0.12 95% CI -0.64 to 0.88), and memory (MD 0.35, 95% CI- 0.43 to 1.13) (Analysis 1.2).

Quality of life at the end of follow-up

One trial with 33 participants evaluated health-related quality of life measured by means of self-report using the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) and Stroke-Specific Quality of Life Scale (SS-QOL) (Chou 2009). It showed that real acupuncture was not superior to sham acupuncture in the improvement of health-related quality of life measured by the SF-36 (physical component summary: MD -2.66, 95% CI -10.57 to 5.25; mental component summary: MD 11.52, 95% CI -1.76 to 24.80; Analysis 1.3), and the SS-QOL (language: MD 13.34, 95% CI -3.02 to 29.70; personality: MD 3.10, 95% CI -11.73 to 17.93; Analysis 1.4) from baseline to week eight among participants with stroke in the convalescent stage.

No data on death or dependency, the proportion of people requiring institutional care or requiring extensive family support, death from any cause and possible adverse events were available in these two trials (Chou 2009; Naeser 1992).

Acupuncture plus baseline treatment versus baseline treatment alone

Twenty-nine trials compared acupuncture plus baseline treatment with baseline treatment alone (Bao 2012; Dai 1997; Gao 2014a; Guo 2011; Guo 2012; Huang 2008a; Ke 2015; Li 1997a; Li 2010a; Li 2011a; Li 2013a; Liu 2013a; Lun 1999; Sun 2013a; Sun 2015; Wang 2001; Wang 2011a; Wang 2012; Wu 2008; Wu 2011a; Wu 2013a; Xu 2013; Yao 2014; Zhan 2014; Zhang 2013a; Zhang 2015; Zheng 2014; Zhou 2014; Zhu 2007).

Death or dependency at the end of treatment and follow-up

No data on death at the end of treatment or follow-up were available in any of the included trials.

Eleven trials with a total of 956 participants measured improvement of dependency after acupuncture treatment by using continuous scales only (Barthel Index (BI), Modified Barthel Index (MBI) and Activity of Daily Living Scale (ADL)) (Bao 2012; Huang 2008a; Ke 2015; Li 2010a; Li 2011a; Wang 2012; Wu 2011a; Yao 2014; Zhan 2014; Zhang 2015; Zheng 2014). There was significant improvement in dependency measured by the BI, the MBI, and the ADL Scale among participants in the acupuncture group compared with the control group (BI: MD 9.19, 95% CI 4.34 to 14.05; participants = 616; studies = 9; I^2 = 95%; MBI: MD 3.44, 95% CI 0.30 to 6.58; participants = 60; studies = 1; ADL: MD 7.80, 95% CI 6.04 to 9.56; participants = 62; studies = 1; Analysis 2.1). Heterogeneity was significant and may be attributable to differences in severity of stroke, times of evaluation from stroke onset, and types of stroke.

One trial with 147 participants evaluated the effect of acupuncture on the improvement of dependency measured by the BI at the end of three months' follow-up (Zhou 2014). There was a beneficial effect of acupuncture on the improvement of dependency for participants with stroke in the convalescent stage (MD 7.49, 95% CI 1.79 to 13.19; Analysis 2.2). One trial with 71 participants evaluated the effect of acupuncture on the improvement of dependency measured by the ADL scale at the end of one month's follow-up (Sun 2013a). It also showed a beneficial effect of acupuncture on the improvement of dependency (MD 3.83, 95% CI 2.67 to 4.99; Analysis 2.2).

Proportion requiring institutional care or requiring extensive family support at the end of follow-up

No data on the proportion of participants requiring institutional care or extensive family support at the end of follow-up were available in these 29 trials.

Changes of global neurological deficit after acupuncture treatment and at the end of follow-up

Eight trials measured global neurological deficit at the end of treatment and follow-up by using continuous scales. Of these, four trials evaluated the effect of acupuncture on global neurological function measured by the Modified Edinburgh and Scandinavian Stroke Scale (Gao 2014a; Huang 2008a; Zhang 2015; Zhu 2007). There was a significant decrease in the neurological deficit score among participants in the acupuncture group compared with the control group (MD -2.39, 95% CI -3.34 to -1.43; participants = 240; studies = 4; I^2 = 23%; Analysis 2.3). Two trials evaluated the effect of acupuncture on global neurological function measured by the Neurological Function Deficit Scale (NFDS) (Guo 2011; Yao 2014). There was no significant improvement in global neurological function among participants in acupuncture group compared with control group (MD -1.02, 95% CI -5.80 to 3.76; participants = 123; studies = 2; I^2 = 19%; Analysis 2.3). One trial evaluated the effect of acupuncture on the improvement of global neurological function measured by the NFDS at the end of one month follow-up (Sun 2013a). It showed a beneficial effect of acupuncture on the improvement of global neurological function (MD -6.15, 95% CI -7.09 to -5.21; Analysis 2.4). One trial evaluated the effect of acupuncture on the improvement of global neurological function by using the National Institue of Health Stroke Scale (NIHSS) at the end of three months' follow-up (Zhou 2014). There was no significant improvement in global neurological function among participants in acupuncture group compared with control group (MD -0.83, 95% CI -1.94 to 0.28; Analysis 2.4).

Seven trials with a total of 543 participants measured improvement of global neurological deficit after acupuncture treatment by using categorical approaches only (CSRS 1 and CSRS 2) rather than continuous scales, for example changes of global neurological deficit score (Dai 1997; Huang 2008a; Li 1997a; Lun 1999; Wang 2001; Yao 2014; Zhang 2015). There was significant heterogeneity among the seven trials (I^2 = 55%), which was possibly due to differences in outcome measurements used, times of evaluation from stroke onset, and types of stroke. This means that the overall estimate of treatment effect is not reliable. Hence, the apparent improvement of global neurological deficit in the acupuncture group compared with the control group should be interpreted with caution (OR 3.89, 95% CI 1.78 to 8.49; participants = 543; studies = 7; I^2 = 55%; Analysis 2.5).

Changes of specific neurological impairments after acupuncture treatment and at the end of follow-up

Of the 31 included trials, 20 measured specific neurological impairment at the end of treatment and follow-up, mainly including motor function, cognitive function, speech function, depression, swallowing function, pain, sleep, and spasticity.

Motor function

Four trials used the Fugl-Meyer Assessment (FMA) to measure motor function in the upper and lower extremities at the end of treatment (Li 2013a; Wang 2011a; Wu 2011a; Yao 2014). Acupuncture was superior to no acupuncture in the improvement of motor function in the upper and lower extremities (MD 6.16, 95% CI 4.20 to 8.11; participants = 245; studies = 4; I^2 = 28%; Analysis 2.6). One trial with 60 participants evaluated the effect of acupuncture on the improvement of general motor function measured by the Motor Assessment Scale at the end of treatment (Wang 2012). There was a significant difference between the two groups (MD 4.53, 95% CI 2.99 to 6.07; Analysis 2.6). One trial with 147 participants evaluated the effect of acupuncture on the improvement of general motor function measured by the FMA at the end of three months' follow-up (Zhou 2014). There was a beneficial effect of acupuncture on the improvement of general motor function for participants with stroke in the convalescent stage (MD 7.59, 95%CI 0.98 to 14.20; Analysis 2.7).

Two trials measured improvement of motor function after acupuncture treatment by using categorical approaches (FMA) (Li 2013a; Wang 2011a). There was no significant improvement in motor function among participants in the acupuncture group compared with the control group (OR 2.41, 95% CI 0.98 to 5.96; Analysis 2.8).

Cognitive function

Five trials evaluated the effect of acupuncture on the improvement of cognitive function measured by the Mini-Mental State Examination (MMSE) at the end of treatment (Bao 2012; Li 2010a; Li 2011a; Liu 2013a; Zheng 2014). Acupuncture was superior to no acupuncture in the improvement of cognitive function for participants with stroke in the convalescent stage (MD 2.54, 95% CI 0.03 to 5.05; participants = 278; studies = 5; I^2 = 98%; Analysis 2.9). The significant heterogeneity between the trials was possibly due to differences in times of evaluation from stroke onset, severity on entry, needling details, and outcome measurements used. Two trials measured this outcome by using the Montreal Cognitive Assessment Scale (MoCA) at the end of treatment (Bao 2012; Zheng 2014). There was also a beneficial effect of acupuncture on the improvement of cognitive function for participants with stroke in the convalescent stage (MD 1.34, 95% CI 0.76 to 1.92; participants = 120; studies = 2; I^2 = 0%; Analysis 2.9). The difference in one trial in which cognitive function was evaluated by the Revised Hasegawa Dementia Scale (HDS-R) was significant too (Li 2010a) (MD 1.26, 95% CI 0.29 to 2.23; participants = 46; studies = 1; Analysis 2.9). One trial evaluated the effect of acupuncture on the improvement of cognitive function measured by MMSE at the end of one month's follow-up (Sun 2013a). There was a significant difference between the two groups (MD 3.47, 95% CI 2.43 to 4.51; Analysis 2.10).

Three trials measured improvement of cognitive function after acupuncture treatment by using categorical approaches (MMSE) (Bao 2012; Li 2010a; Zheng 2014). There was no significant heterogeneity among them. It showed that acupuncture was beneficial for the improvement of cognitive function in participants with stroke in the convalescent stage (OR 3.82, 95% CI 1.89 to 7.72; participants = 166; studies = 3; I^2 = 0%; Analysis 2.11). One trial with 46 participants evaluated this outcome measured by categorical approaches (HDS-R). It also showed that acupuncture was beneficial for the improvement of cognitive function in participants with stroke in the convalescent stage (OR 4.02, 95% CI 1.12 to 14.46; Analysis 2.11).

Depression

Six trials evaluated the effect of acupuncture on the improvement of depression measured by the Hamilton Depression Scale (HAMD) at the end of treatment (Guo 2011; Gao 2014a; Sun 2015; Wu 2008; Zhang 2013a; Zhou 2014). There was a beneficial effect of acupuncture on the improvement of depression for participants with stroke in the convalescent stage (MD -2.58, 95% CI -3.28 to -1.87; participants = 552; studies = 6; I^2 = 71%; Analysis 2.12). One trial measured this outcome by using the Symtoms of Traditional Chinese Medicine (TCM) depression scale (Gao 2014a). There was also a beneficial effect of acupuncture on the improvement of depression for participants with stroke in the convalescent stage (MD -1.57, 95% CI -2.96 to -0.18; Analysis 2.12).

Four trials measured improvement of depression after acupuncture treatment by using categorical approaches (HAMD) (Gao 2014a; Sun 2015; Wu 2008; Zhang 2013a). There was no significant heterogeneity among them. It also showed that acupuncture was beneficial for the improvement of depression in participants with stroke in the convalescent stage (OR 2.03, 95% CI 1.10 to 3.72; participants = 342; studies = 4; I^2 = 0%; Analysis 2.13).

Swallowing function

Three trials evaluated the effect of acupuncture on the improvement of swallowing function at the end of treatment (Guo 2012; Wu 2013a; Xu 2013). Acupuncture was superior to no acupuncture in the improvement of dysphagia measured by a drinking test in two trials (Wu 2013a; Xu 2013) (MD -1.11, 95% CI -2.08 to -0.14; participants = 200; studies = 2; I^2 = 96%; Analysis 2.14). The difference was also significant in another trial in which dysphagia was evaluated categorically by a drinking test (Guo 2012) (OR 95.29, 95% CI 10.93 to 830.86; Analysis 2.15).

Pain

Two trials evaluated the effect of acupuncture on the improvement of pain measured by the Visual Analogue Scale (VAS) (Wang 2011a; Yao 2014). There was a significant decrease in scores among participants in the acupuncture group compared with the control group (MD -2.88, 95% CI -3.68 to -2.09; participants = 118; studies = 2; I^2 = 0%; Analysis 2.16). It showed that acupuncture was superior to no acupuncture in the improvement of pain.

Sleep

One trial evaluated the effect of acupuncture on the improvement of sleep quality measured by the Rhone Planck Sleepiness Scale (Zhang 2013a). There was no significant improvement in sleep quality among participants in the acupuncture group compared with the control group (MD -1.09, 95% CI -2.37 to 0.19; Analysis 2.17).

Spasticity

One trial evaluated the effect of acupuncture on the improvement of spasticity measured by the Modified Ashworth Spasticity Rating Scale (Wu 2011a). There was a beneficial effect of acupuncture on the improvement of spasticity for participants with convalescent stroke (MD -0.40, 95% CI -0.64 to -0.16; participants = 60; studies = 1; Analysis 2.18).

Death from any cause during the whole treatment and follow-up period

No data on death from any cause during the period of treatment and follow-up were available in these 29 trials.

Quality of life at the end of follow-up

One trial reported no significant change in health-related quality of life measured by means of self-report using the Medical Outcomes Study 36-Item Short-Form Health Survey (SF- 36) from baseline to one month after treatment among participants in the acupuncture group compared with the control group (Sun 2013a) (MD 2.73, 95% CI -0.54 to 6.00; participants = 71; studies = 1; Analysis 2.19).

Possible adverse events

Adverse events were reported in five trials (Li 2010a; Sun 2013a; Sun 2015; Zhang 2013a; Zhou 2014). Of these, three trials reported no obvious adverse events related to acupuncture (Li 2010a; Sun 2015; Zhang 2013a). Zhou 2014 reported bleeding, haematoma, and pain at the acupoint in the acupuncture group and Sun 2013a found itchiness of the skin at the acupoint in one participant in the acupuncture group. No other serious adverse events were reported.

Subgroup analysis

We were unable to perform pre-determined subgroup analyses based on time of starting acupuncture and stroke severity because most trials did not provide information for the specified outcomes.

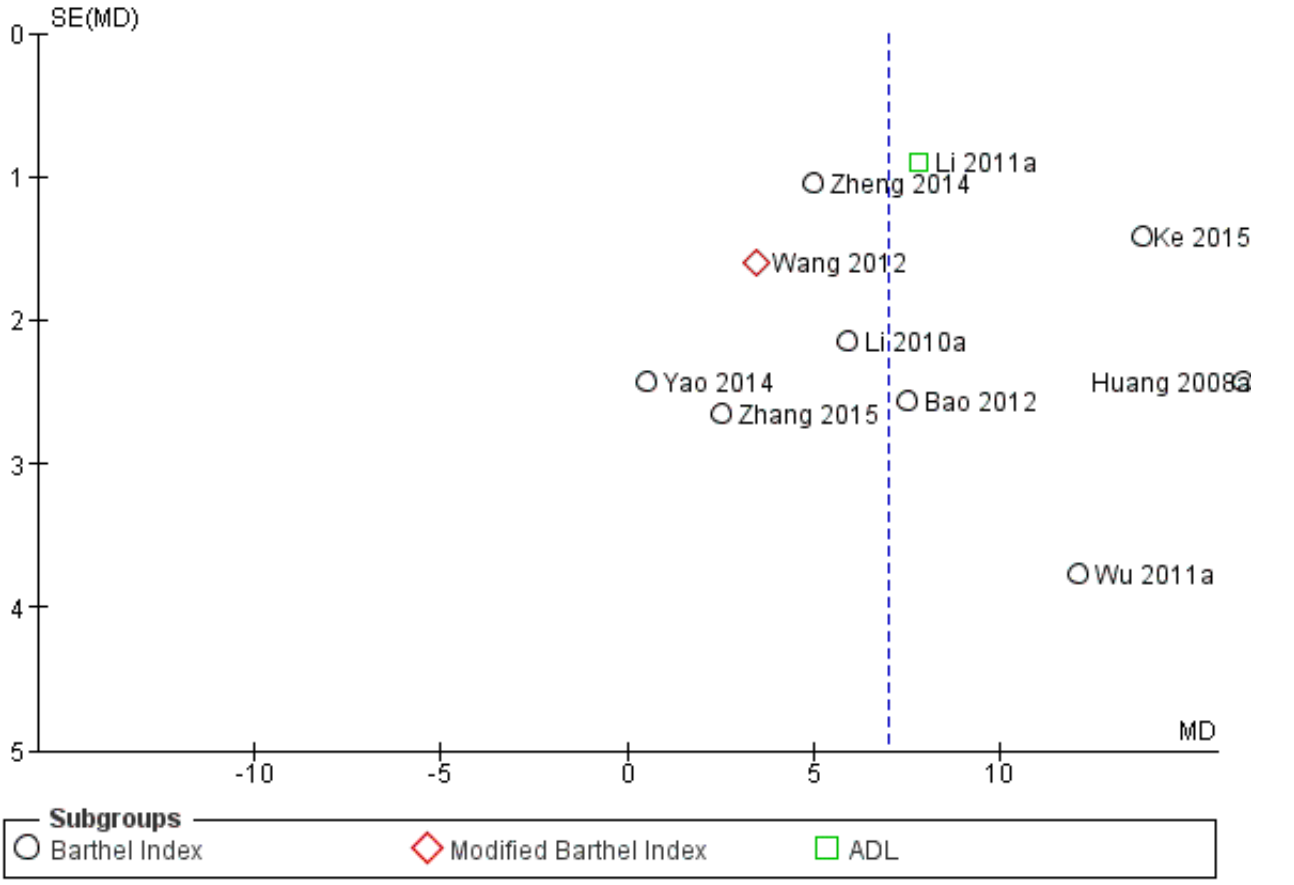
Sensitivity analysis

We were unable to perform the predetermined sensitivity analyses for trials with adequate concealment of randomisation and blinding, and that were published in languages other than Chinese because most trials did not provide the necessary data.

Publication bias

Nine trials comparing acupuncture plus baseline treatment with baseline treatment alone evaluated the effect of acupuncture on the improvement of dependency measured by the Barthel Index. Based on these nine trials, we produced a funnel plot to check for publication bias in this systematic review. We found that the funnel plot was asymmetric (Figure 4).

Figure 4. Funnel plot of comparison 2, Acupuncture + baseline treatment versus baseline treatment alone, outcome: 2.1 Improvement of dependency at the end of treatment.



Although funnel plot asymmetry has long been equated with publication bias, the funnel plot should be seen as a generic means of displaying small-study effects. Small-study effects may be due to factors other than publication bias, such as poor methodological quality leading to spuriously inflated effects in smaller studies, true heterogeneity, artefactual, and chance (Sterne 2011).

DISCUSSION

Summary of main results

We included 31 trials in this review, with a total of 2257 participants in the subacute or chronic stage of stroke. Two trials were conducted outside China (Chou 2009; Naeser 1992) and the remaining 29 trials were conducted in China. The present review on acupuncture for stroke is also not representative of different racial groups.

The results revealed the following.

1. Compared with no acupuncture, for people with stroke in the subacute or chronic stage, acupuncture may have a beneficial effect on improving dependency (activities of daily living); global neurological deficiency; and specific neurological impairments including motor function, cognitive function, depression, swallowing function, pain, and spasticity.
2. Acupuncture was not superior to sham acupuncture or no acupuncture on improving the quality of life in people with stroke in the subacute or chronic stage.
3. There were no serious adverse events reported in people with stroke in the convalescent stage using acupuncture.
4. Currently there is no evidence from the included RCTs for the effect of acupuncture on death, requiring institutional care, and all-cause mortality in people with stroke in the subacute or chronic stage.

Overall completeness and applicability of evidence

In this systematic review, a substantial number of the included studies were conducted in China and were published in Chinese. Our electronic searching successfully identified studies for which an abstract was available in Chinese, as well as a number of studies based on English titles. However, we believe it is likely that we will not have identified all relevant Chinese trials, in particular those for which only English titles were available and those not published in journals included in the electronic databases that we searched. The asymmetric funnel plot further proved that there was existing publication bias in this systematic review (Figure 4).

Many of the relevant trials that we included were published only as brief reports. This was frequently the case for studies published in Chinese, for which published versions were often less than two pages long. Although we contacted study authors, when possible, to confirm study eligibility, we did not have the time or resources to contact all study authors for further information on trial design or study results. Thus, in general the completeness of study information is low, resulting in a high number of studies for which risk of bias is classed as 'unclear'.

Characteristics of participants

The studies included In this review were predominantly conducted in China, so the review is not representative of different racial groups. The type and severity of stroke may alter the effects of acupuncture on people with stroke. From the available information, it was not possible to perform pre-specified subgroup analyses comparing people with different severities of stroke, and different times to start of treatment after stroke. This was due firstly, to the limited number studies for the specified outcomes, secondly, to only some of the included trials reporting data on severity, and thirdly, to most trials not clearly defining the interval between stroke onset and the start of the intervention treatment, and including participants with a mix of different intervals from stroke onset to start of intervention treatment.

Properties of interventions

The quality of acupuncture treatment is closely related to its effectiveness. Misleading results may have occurred if the treatment schedules were inadequate or administered by unskilled practitioners. However, information on the experience and training of the acupuncturists who gave the treatments was available in only one trial (Chou 2009). Furthermore, the acupuncture techniques, the number of acupoints, the number and duration of sessions, and the duration of the intervention period varied across trials. Some trials reported that the acupuncture points, the number of sessions, and the duration of treatment were individualised according to the practical conditions in each stroke patient. From the scarce description of treatment in all trials, it is difficult to evaluate if the acupuncture treatment was valid or not. The consensus of an international group of experienced acupuncturists and researchers was that clinical trials of acupuncture must use an optimal form of treatment, defined by examining standard texts and by surveying and consulting experts, and must be reported by using Revised Standards for Reporting Interventions in ClinicalTrials of Acupuncture (STRICTA) (Hugh 2010).

Outcomes measures

Efficacy

Because post-stroke neurological recovery is known to be obvious within three months, especially post-stroke motor recovery, and unlikely beyond six months, mixing people with interval from stroke onset of less than three months, three to six months, and more than six months in one sample would make the assessment of the efficacy of an intervention methodologically unsound. From the available information, it was not possible to perform pre-specified subgroup analyses comparing people with different times to start of treatment (within three months, three to six months, and after six months) for each outcome. This was due to the limited amount of data, the varied outcome measurements, or both, in this systematic review.

The long-term goal of treatment for stroke is to reduce mortality and disability, and ultimately to prolong survival and improve quality of life. Data available from the included trials were mainly secondary outcomes. There was a lack of data from RCTs on clinically relevant outcomes at long-term follow up, such as mortality and quality of life. The lack of reliable evidence on primary outcomes meant that we were unable to draw conclusions about the influence of acupuncture on stroke.

Adverse events

Of the 31 included trials with a total of 2257 participants in the convalescent phase of stroke, only one participant was reported to have suffered from bleeding and three participants were reported

to have suffered from intolerance to pain at acupoints. There were no serious adverse events reported. From the available evidence, it appears that acupuncture is a safe treatment when used for people with stroke. However, it should be noted that this result was based on insufficient information from five trials with a small number of participants (Li 2010a; Sun 2013a; Sun 2015; Zhang 2013a; Zhou 2014). Most trials in this systematic review did not report whether any adverse events relevant to acupuncture were apparent in their participants. The reasons for insufficient reporting of adverse events were possibly as follows. Firstly, Chinese practitioners perceive acupuncture as free of side effects, secondly, because these are rare events, data from RCTs will almost never be sufficient to prove or disprove a causal relationship between a complementary and alternative medicine (CAM) therapy and a rare adverse event, and thirdly, study authors reported positive effects without reporting adverse events as well. However, some studies demonstrated that serious adverse events have been associated with acupuncture, such as infections (HIV, hepatitis, subacute bacterial endocarditis) caused by non-sterile needles, or complications (pneumothorax, cardiac tamponade) caused by tissue trauma, but the incidence of adverse events was unknown (Ernst 1997).

Quality of the evidence

The current available evidence shows that acupuncture may have beneficial effects on the improvement of dependency, global neurological deficiency, and specific neurological deficiency in some dimensions. Unfortunately due to low methodological quality with regard to methods of randomisation, allocation concealment and blinding of assessment of most included trials, and probable publication bias, there is currently insufficient evidence to support the routine use of acupuncture for people with stroke in the convalescent stage. The general low methodological quality of the included trials of acupuncture for stroke prohibited meaningful sensitivity analyses to illuminate the robustness of the results of the review to the exclusion of those trials with inadequate methodology. It was also not possible to perform sensitivity analysis to confirm the robustness of the results of the review to the exclusion of Chinese trials, because only two non-Chinese trials were included. However, this systematic review provides comprehensive and updated information on the effects of acupuncture for stroke in the convalescent stage for clinical practice. Therefore, further research on acupuncture for stroke is worthwhile in future.

Potential biases in the review process

The major limitations of this review are related to the weakness inherent in the available published literature on acupuncture for stroke. While most studies reported global and specific neurological deficit results, the measurement of the outcomes varied considerably across trials. The combined results from studies with such wide variation were unreliable. Furthermore, many studies did not provide detailed information on the severity of the disease, the exact time of starting the acupuncture treatment, the modalities of acupuncture technique and acupuncturist's background, and possible adverse effects relevant to acupuncture treatment. This brings the generalisability of the results into question.

Another limitation of this systematic review is that publication bias might be present, as indicated by the asymmetric funnel plot for the effect of acupuncture on the improvement of dependency measured by the Barthel Index. Although we undertook extensive literature searches, we still could not exclude the possibility that studies with negative findings remain unpublished.

AUTHORS' CONCLUSIONS

Implications for practice

Although acupuncture may have positive effects in stroke rehabilitation and there were no reported serious adverse events, the small number of low quality studies and the probability of publication bias means that there was insufficient evidence to support the routine use of acupuncture for people with subacute or chronic stroke.

Implications for research

The widespread use of acupuncture, the promising results with less severe side effects, lower cost, and the insufficient quality of the available trials warrant further research. Large sham or placebo-controlled trials are needed to confirm or refute the available evidence. The following features should be addressed in further studies.

1. Detailed reporting of the generation of the allocation sequence and allocation concealment.
2. Application and clear description of blinding.
3. Use of placebo or sham acupuncture as the control.
4. Clear definition of the modality of acupuncture, and acupuncture technique based on evidence or a consensus of experts (STRICTA).
5. Use of standard validated outcome measures.
6. Reporting of clinically important outcome measures at long-term follow-up, such as mortality and quality of life.
7. Adverse events critically assessed by standardised monitoring or an effective self-report system. Attention should be paid to rare, severe adverse events relevant to acupuncture.
8. The study should be reported according to the STRICTA criteria (Hugh 2010) in conjunction with the CONSORT statement (Schulz 2010).

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CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Bao 2012

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 60 (30/30) Demographics: aged 50-73 years, 67% male Type of stroke: ischaemic only Diagnosis: WHO definition and all confirmed by CT Severity on entry: not stated Time from stroke onset: 3-12 months Setting: inpatient and outpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: both body and scalp acupoints. Numbers of points used: 4 scalp acupoints and 3 body acupoints
	  ○ Depths of insertion: not stated
	  ○ Deqi elicited: yes

Bao 2012 *(Continued)*

	◦ Needle stimulation: manual ◦ Needle retention time: 50 minutes ◦ Needle type: hua tuo brand • Treatment regimen ◦ Number of treatment sessions: 56 sessions ◦ Frequency of treatment: 7 sessions/week ◦ Total course: 8 weeks • Practitioner background: not stated • Co-intervention: WM Control interventions: WM
Outcomes	• Improvement of cognitive function (MMSE, MoCA) • Improvement of independence (Barthel index) • FU: 8 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Chou 2009

Methods	RCT Method of randomisation: not stated

Chou 2009 *(Continued)*

	Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: 5
Participants	Country: UK Number of participants included: 33 (17/16) Demographics: aged 59-90 years, 48% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: unclear Time from stroke onset: 13-33 months Setting: inpatient Comparability: comorbidity and past history similar

Interventions	Comparison: real acupuncture + PT versus sham acupuncture + PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: stated
	• Needling details
	  ○ Points used: body acupoints
	  ○ Numbers of points used: 2 acupoints
	  ○ Depths of insertion: 0.03 inch
	  ○ Deqi elicited: yes
	  ○ Needle stimulation: electrical
	  ○ Needle retention time: 20 minutes
	  ○ Needle type: the needles were 1 inch long
	• Treatment regimen
	  ○ Number of treatment sessions: 16 sessions
	  ○ Frequency of treatment: 2/week
	  ○ Total course: 8 weeks
	• Practitioner background: has been practicing Traditional Chinese Medicine for many years after graduating from medical school (China Medical University, Taichung, Taiwan)
	• Co-intervention: PT
	
	Control interventions: sham acupuncture + PT

Outcomes	• Improvement of cognitive function (LOTCA-G) • Quality of life (SF-36, SS-QOL) • FU: 8 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias)	Unclear risk	Information on blinding was not reported

Chou 2009 *(Continued)*

All outcomes		
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Treatment: 3 participants could not finish the treatment protocol Control: 2 participants decided not to receive rehabilitation
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Dai 1997

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 136 (46/45/45) Demographics: aged 48-86 years, 75% male Type of stroke: ischaemic only Diagnosis: WHO definition and all confirmed by CT Severity on entry: mild to severe Time from stroke onset: 3-14 months Setting: unclear Comparability: unclear

Interventions	3 arms:
	
	• acupuncture + WM
	• acupuncture only
	• WM only
	
	Comparison eligible: acupuncture + WM versus WM only
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details:
	  ○ points used: both body and scalp (three temporal points) acupoints
	  ○ Numbers of points used: 5-11 points
	  ○ Depths of insertion: 1.5-2.0 inches
	  ○ Deqi elicited: yes

Dai 1997 *(Continued)*

	◦ Needle stimulation: manual ◦ Needle retention time: 30 minutes ◦ Needle type: stainless steel, gauge 26-30#, length 2.0-2.6 inches • Treatment regimen: ◦ Number of treatment sessions: 30 sessions ◦ Frequency of treatment: 1 session/day ◦ Total course: 30 days • Practitioner background: not stated • Co-intervention: ◦ aspirin 25 mg qd orally Control interventions: WM: aspirin 25 mg qd orally
Outcomes	Number of participants with improvement in global neurological deficit (CSRS 1 score decrease > 18%) at the end of treatment FU: 30 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Gao 2014a

Methods	RCT

Gao 2014a *(Continued)*

	Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: none
Participants	Country: China Number of patients included: 60 (30/30) Demographics: 50% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 3-6 months Setting: outpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 1 scalp acupoint and 5 body acupoints
	  ◦ Depths of insertion: 0.66-1.05 inches
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: hua tuo brand, length 1.57 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 24 sessions
	  ◦ Frequency of treatment: 6 sessions/week
	  ◦ Total course: 4 weeks
	• Practitioner background: not stated
	• Co-intervention: WM
	
	Control interventions: WM

Outcomes	• Improvement of depression (HAMD) • Improvement of neurological function (MESS and SSS) • TCM syndrome scoring criteria
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on the allocation concealment was not reported
Blinding (performance bias and detection bias)	Unclear risk	Information on blinding was not reported

Gao 2014a *(Continued)*

All outcomes		
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	No participants lost to follow-up
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Guo 2011

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 95 (32/31/32) Demographics: aged 40-65 years, 61% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 1-6 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	3 arms:
	
	• acupuncture only
	• WM only
	• acupuncture + WM
	
	Comparison eligible: acupuncture + WM versus WM only
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 4 scalp acupoints and 2 body acupoints
	  ◦ Depths of insertion: not stated
	  ◦ Deqi elicited: not stated

Guo 2011 *(Continued)*

	◦ Needle stimulation: manual and electrical ◦ Needle retention time: 30 minutes ◦ Needle type: not stated • Treatment regimen ◦ Number of treatment sessions: 30 sessions ◦ Frequency of treatment: 5 sessions/week ◦ Total course: 6 weeks • Practitioner background: not stated • Co-intervention: WM Control interventions: WM
Outcomes	• Improvement of depression (HAMD) • Improvement of neurological function (Clinical Neurological Function Defect Scale) • FU: 6 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Guo 2012

Methods	RCT Method of randomisation: not stated

Guo 2012 *(Continued)*

	Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 60 (30/30) Demographics: aged 38 to 73 years, 68% male Type of stroke: unclear Diagnosis: unclear Severity on entry: not stated Time from stroke onset: 3 months to 5 years Setting: inpatient Comparability: comorbidity and past history similar

Interventions	Comparison: acupuncture + OT versus OT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: body acupoints
	  ◦ Numbers of points used: 1 acupoint
	  ◦ Depths of insertion: 0.28-0.55 inch
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: not stated
	  ◦ Needle type: the needles were 1.57 inches long
	• Treatment regimen
	  ◦ Number of treatment sessions: 6-12 sessions
	  ◦ Frequency of treatment: 6/week
	  ◦ Total course: 1-2 weeks
	• Practitioner background: not stated
	• Co-intervention: OT
	
	Control interventions: OT

Outcomes	Number of participants with improvement in swallowing function (water drinking test)
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported

Guo 2012 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Huang 2008a

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 90 (30/30/30) Demographics: 67% male Type of stroke: ischaemic only Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 1-3 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	3 arms:
	
	• acupuncture only
	• PT only
	• acupuncture + PT
	
	Comparison eligible: acupuncture + PT versus PT only
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: scalp acupoints
	  ◦ Numbers of points used: 3 points
	  ◦ Depths of insertion: 0.98-1.38 inches
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual

Huang 2008a *(Continued)*

	○ Needle retention time: 30 minutes ○ Needle type: the needles were 1.57 inches long • Treatment regimen ○ Number of treatment sessions: 24 sessions ○ Frequency of treatment: 6 sessions/week ○ Total course: 4 weeks • Practitioner background: not stated • Co-intervention: PT Control interventions: PT
Outcomes	• Neurological function (MESS and SSS) • Independence (Barthel Index)
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information provided
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Ke 2015

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated

Ke 2015 *(Continued)*

	ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 80 (40/40) Demographics: aged 61-83 years, 55% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition Severity on entry: not stated Time from stroke onset: 2-18 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + PT versus PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: body acupoints
	  ○ Numbers of points used: 27 body acupoints
	  ○ Depths of insertion: 0.66-5.25 inches
	  ○ Deqi elicited: not stated
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 30-40 minutes
	  ○ Needle type: not stated
	• Treatment regimen
	  ○ Number of treatment sessions: 30 sessions
	  ○ Frequency of treatment: 7 sessions/week
	  ○ Total course: 30 days
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of syndrome (TCM syndrome scoring criteria) • Improvement of independence (Barthel Index) • FU: 30 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported

Ke 2015 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Li 1997a

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 112 (42/20/50) Demographics: aged 24-76 years Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT or MRI Severity on entry: not stated Time from stroke onset: 1 month to 8.5 years Setting: inpatients Comparability: comorbidity and past history similar

Interventions	3 arms:
	
	• acupuncture + PT and OT
	• acupuncture only
	• PT and OT
	
	Comparison eligible: acupuncture + PT and OT versus PT and OT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 10-12 points
	  ◦ Depths of insertion: not stated
	  ◦ Deqi elicited: unclear
	  ◦ Needle stimulation: manual

Li 1997a *(Continued)*

	○ Needle retention time: 30 minutes ○ Needle type: not stated • Treatment regimen ○ Number of treatment sessions: 72 sessions ○ Frequency of treatment: 6 sessions/week ○ Total course: 3 months • Practitioner background: not stated • Co-intervention: baseline medication, PT and OT Control interventions: baseline medication plus PT and OT
Outcomes	Number of participants with improvement in global neurological deficit (CSRS 1 score) at the end of treatment FU: 3 months
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Li 2010a

Methods	RCT Method of randomisation: random number table Blinding: not stated

Li 2010a *(Continued)*

	Adverse effects: none ITT analysis: not stated Losses to FU: 4
Participants	Country: China Number of participants included: 46 (24/22) Demographics: aged 47-79 years, 59% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 1-36 months Setting: outpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 5 scalp acupoints and 6 body acupoints
	  ◦ Depths of insertion: 0.66-1.5 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual and electrical
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: gauge 30#, length 1.97 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 60 sessions
	  ◦ Frequency of treatment: 5 sessions/week
	  ◦ Total course: 12 weeks
	• Practitioner background: not stated
	• Co-intervention: WM
	
	Control interventions: WM

Outcomes	• Improvement of cognitive function (MMSE HDS-R) • Improvement of independence (Barthel Index) • Adverse events • FU: 12 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported

Li 2010a *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Treatment: 1 participant could not finish the treatment protocol Control: 3 participants could not finish the control protocol
Selective reporting (reporting bias)	Unclear risk	Some patient-related outcomes were not reported, such as information on quality of life or all-cause mortality
Other bias	Unclear risk	No information provided

Li 2011a

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 62 (31/31) Demographics: 54% male Type of stroke: unclear Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 6-20 months Setting: outpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: body acupoints
	  ◦ Numbers of points used: 7 body acupoints
	  ◦ Depths of insertion: 0.39-1.05 inches
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: not stated
	  ◦ Needle type: stainless steel needle gauge 28#, length 1.31 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 28 sessions
	  ◦ Frequency of treatment: 7 sessions/week
	  ◦ Total course: 4 weeks

Li 2011a *(Continued)*

	• Practitioner background: not stated • Co-intervention: WM Control interventions: WM
Outcomes	• Improvement of cognitive function (MMSE) • Improvement of independence (ADL) • FU: 4 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Li 2013a

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 60 (20/20/20)

Li 2013a *(Continued)*

	Demographics: aged 40-75 years Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 1-3 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	3 arms:
	• acupuncture only
	• PT only
	• acupuncture + PT
	Comparison eligible: acupuncture + PT versus PT only
	Acupuncture treatment
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: body acupoints
	  ○ Numbers of points used: 12 points
	  ○ Depths of insertion: not stated
	  ○ Deqi elicited: not stated
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 30 minute
	  ○ Needle type: not stated
	• Treatment regimen
	  ○ Number of treatment sessions: not stated
	  ○ Frequency of treatment: 7 sessions/week
	  ○ Total course: not stated
	• Practitioner background: not stated
	• Co-intervention: PT
	Control interventions: PT

Outcomes	• Improvement of motor function (Fugl-Meyer Assessment) • Improvement of pain (Visual Analogue Score) • Improvement of independence (ADL) • FU: not stated
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported

Li 2013a *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Liu 2013a

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 50 (25/25) Demographics: aged 35-74 years, 68% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT Severity on entry: not stated Time from stroke onset: 3-12 months Setting: inpatient Comparability: no significant difference in age, comorbidity, or time post onset

Interventions	Comparison: acupuncture + daily OT versus daily OT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: scalp acupoints
	  ◦ Numbers of points used: 2 scalp acupoints
	  ◦ Depths of insertion: 1.05-1.31/0.66 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual and electrical stimulation
	  ◦ Needle retention time: 90 minutes
	  ◦ Needle type: hua tuo brand, length 0.98 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 24 sessions
	  ◦ Frequency of treatment: 6 sessions/week
	  ◦ Total course: 4 weeks

Liu 2013a *(Continued)*

	• Practitioner background: not stated • Co-intervention: OT Control interventions: OT
Outcomes	• Improvement of cognitive function (MMSE) • Independence (ADL) • FU: 24 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Lun 1999

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 109 (61/48)

Lun 1999 *(Continued)*

	Demographics: aged 35-75 years, 60% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT before entry Severity on entry: not stated Time from stroke onset: 2 months to 5 years Setting: unclear Comparability: unclear

Interventions	Comparison: acupuncture + TCM versus TCM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: scalp acupoints
	  ◦ Numbers of points used: 5 points
	  ◦ Depths of insertion: 2-2.6 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: 30 minute
	  ◦ Needle type: stainless steel needle, gauge 28-30#, length 2.6 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 30 sessions
	  ◦ Frequency of treatment: 1/day
	  ◦ Total course: 45 days
	• Practitioner background: not stated
	• Co-intervention: baseline TCM
	
	Control interventions: TCM

Outcomes	Number of participants with improvement in global neurological deficit (CSRS 2) at the end of treatment FU: 45 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias)	Unclear risk	Information on blinding was not reported

Lun 1999 *(Continued)*
All outcomes

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Naeser 1992

Methods	RCT Method of randomisation: not stated Blinding: participants blinded Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: USA Number of participants included: 16 (10/6) Demographics: aged 44-74 years Type of stroke: ischaemic only Diagnosis: all confirmed by CT Severity on entry: moderate Time from stroke onset: 1-3 months Setting: inpatients Comparability: no significant difference in age or time post onset

Interventions	Comparison: real acupuncture + daily PT versus sham acupuncture + daily PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 11 body acupoints; numbers of scalp acupoints unclear
	  ◦ Depths of insertion: unclear
	  ◦ Deqi elicited: unclear
	  ◦ Needle stimulation: electrical stimulation with frequency 1-2 Hz and amplitude unknown
	  ◦ Needle retention time: 20 minutes
	  ◦ Needle type: gauge 34#, length and material unknown
	• Treatment regimen
	  ◦ Number of treatment sessions: 20 sessions
	  ◦ Frequency of treatment: 5 sessions/week
	  ◦ Total course: 4 weeks
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions
	
	• Sham
	• Acupuncture + PT

Naeser 1992 *(Continued)*

Outcomes	Number of participants with improvement in motor function (BMIT) within 5 days after completing treatment FU: 35 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Quote: "The sham acupuncture was done only on the non-paralyzed upper extremity and lower extremity. The patients were told that in China acupuncture is used on the non-paralysed side to treat the paralysed side. They were further told that the stimulation was low level, and they would not feel anything"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Sun 2013a

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: 1 ITT analysis: not stated Losses to FU: 7
Participants	Country: China Number of participants included: 71 (36/35) Demographics: aged 51-72 years, 56% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition Severity on entry: not stated Time from stroke onset: 3-9 months

Sun 2013a *(Continued)*

	Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + OT + WM versus OT + WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: both body and scalp acupoints
	  ○ Numbers of points used: 7 scalp acupoints and 5 body acupoints
	  ○ Depths of insertion: 0.26-1.97 inches
	  ○ Deqi elicited: yes
	  ○ Needle stimulation: manual and electrical
	  ○ Needle retention time: 30 minutes
	  ○ Needle type: hua tuo brand, length 1.31-1.97 inches
	• Treatment regimen
	  ○ Number of treatment sessions: 45 sessions
	  ○ Frequency of treatment: 1 session/day
	  ○ Total course: 45 days
	• Practitioner background: not stated
	• Co-intervention: OT + WM
	
	Control interventions: OT + WM

Outcomes	• Improvement of symptoms of turbid phlegm obstructing orifices • Improvement of cognitive function (MMSE) • Improvement of independence (ADL) • Improvement of neurological function (NDFS) • Improvement of quality of life (MOS, SF-36) • Adverse event: itchiness of the skin at the acupoint in one participant in the acupuncture group • FU: 45 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias)	Unclear risk	Information on blinding was not reported

Sun 2013a *(Continued)*
All outcomes

Incomplete outcome data (attrition bias) All outcomes	Low risk	4 participants could not finish the treatment protocol, 3 participants lost to follow-up
Selective reporting (reporting bias)	Unclear risk	Some patient-related outcomes were not reported, such as information on quality of life or all-cause mortality
Other bias	Unclear risk	No information provided

Sun 2015

Methods	RCT Method of randomisation: randomisation by using envelopes Blinding: not stated Adverse effects: none ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 93 (31/31/31) Demographics: aged 60-95 years, 47% male Type of stroke: unclear Diagnosis: WHO definition Severity on entry: not stated Time from stroke onset: 9-46 months Setting: inpatient and outpatient Comparability: no significant difference in age, comorbidity, or time post onset

Interventions	3 arms:
	
	• acupuncture only
	• WM only
	• acupuncture + WM
	
	Comparison eligible: acupuncture + WM versus WM only
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: both body and scalp acupoints
	  ○ Numbers of points used: 6 body acupoints, 3 scalp acupoints
	  ○ Depths of insertion: not stated
	  ○ Deqi elicited: yes
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 30 minutes
	  ○ Needle type: hua tuo brand, length 1.57 inches
	• Treatment regimen
	  ○ Number of treatment sessions: 120 sessions
	  ○ Frequency of treatment: 5 sessions/week
	  ○ Total course: 24 weeks
	• Practitioner background: not stated
	• Co-intervention: WM

Sun 2015 *(Continued)*

	Control interventions: WM
Outcomes	• Improvement of depression (HAMD) • Adverse event
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using envelopes assorted in a random manner
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Some patient-related outcomes were not reported, such as information on quality of life or all-cause mortality
Other bias	Unclear risk	No information provided

Wang 2001

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 90 (34/30/26) Demographics: aged 39-75 years, 56% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT Severity on entry: not stated Time from stroke onset: 2 months to 5 years Setting: unclear

Wang 2001 *(Continued)*

	Comparability: unclear

Interventions	3 arms:
	• acupuncture + TCM
	• acupuncture only
	• TCM only
	Comparison eligible: acupuncture + TCM versus TCM only
	Acupuncture treatment
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: body acupoints
	  ○ Numbers of points used: 6-10 points
	  ○ Depths of insertion: not stated
	  ○ Deqi elicited: yes
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 30 minutes
	  ○ Needle type: not stated
	• Treatment regimen
	  ○ Number of treatment sessions: 60 sessions
	  ○ Frequency of treatment: 10 sessions/13 days
	  ○ Total course: 78 days
	• Practitioner background: not stated
	• Co-intervention: TCM
	Control interventions: TCM

Outcomes	• Number of participants with improvement in global neurological deficit (CSRS 2) at the end of treatment • FU: 78 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias)	Unclear risk	Information on blinding was not reported

Wang 2001 *(Continued)*
All outcomes

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Wang 2011a

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 85 (43/42) Demographics: aged 40-80 years, 65% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 33-192 days Setting: inpatient and outpatient Comparability: no significant difference in age, comorbidity, or time post onset

Interventions	Comparison: acupuncture + PT + OT versus PT + OT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: body acupoints
	  ◦ Numbers of points used: 10 acupoints
	  ◦ Depths of insertion: 0.08-0.2 inches
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: not stated
	  ◦ Needle type: not stated
	• Treatment regimen
	  ◦ Number of treatment sessions: 10 sessions
	  ◦ Frequency of treatment: 3-4 sessions/week
	  ◦ Total course: 3 weeks
	• Practitioner background: not stated
	• Co-intervention: PT + OT
	
	Control interventions: PT + OT

Outcomes	• Improvement of motor function (Fugl-Meyer Assessment) • Improvement of pain (Visual Analogue Scale)

Wang 2011a *(Continued)*

	• FU: 3 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Wang 2012

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 60 (30/30) Demographics: aged 43-77 years, 65% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 1-6 months Setting: inpatient Comparability: no significant difference in age or time post onset

Wang 2012 *(Continued)*

Interventions	Comparison: acupuncture + PT versus PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: scalp acupoints
	  ○ Numbers of points used: 4 points
	  ○ Depths of insertion: 0.98-1.38 inches
	  ○ Deqi elicited: not stated
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 30 minutes
	  ○ Needle type: stainless steel needle, gauge 30#, length 1.97 inches
	• Treatment regimen
	  ○ Number of treatment sessions: 45 sessions
	  ○ Frequency of treatment: 15 sessions/month
	  ○ Total course: 3 months
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of motor function (Motor Assessment Scale) • Improvement of independence (modified Barthel Index) • FU: 3 months
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported

Wang 2012 *(Continued)*

Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Wu 2008

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 160 (40/40/40/40) Demographics: aged 40-69 years, 63% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 1-6 months Setting: inpatient and outpatient Comparability: no significant difference in age, comorbidity, or time post onset

Interventions	4 arms:
	
	• PT + OT
	• acupuncture + PT + OT
	• WM + PT + OT
	• acupuncture + WM + PT + OT
	
	Comparisons eligible:
	
	• acupuncture + PT + OT versus PT + OT
	• acupuncture + WM + PT + OT versus WM + PT + OT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 2 scalp acupoints and 2 body acupoints
	  ◦ Depths of insertion: not stated
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: not stated
	  ◦ Needle type: not stated
	• Treatment regimen
	  ◦ Number of treatment sessions: 56 sessions
	  ◦ Frequency of treatment: 7 sessions/week
	  ◦ Total course: 8 weeks
	• Practitioner background: not stated
	• Co-intervention: PT + OT/WM + PT + OT

Wu 2008 *(Continued)*

	Control interventions: PT + OT/WM + PT + OT
Outcomes	• Improvement of depression (HAMD)
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Wu 2011a

Methods	RCT Method of randomisation: randomisation by using random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 60 (30/30) Demographics: aged 41-76 years, 55% male Type of stroke: ischaemic only Diagnosis: confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 1 month to 8 years Setting: inpatient

Wu 2011a *(Continued)*

	Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + daily PT versus daily PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 5 scalp acupoints and 16 body acupoints
	  ◦ Depths of insertion: not stated
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: electrical
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: hua tuo brand, length 1.57 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 84 sessions
	  ◦ Frequency of treatment: 7 sessions/week
	  ◦ Total course: 12 weeks
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of spasticity (Ashworth) • Improvement of motor function (Fugl-Meyer Assessment) • Improvement of independence (Barthel Index) • FU: 12 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported

Wu 2011a *(Continued)*

Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Wu 2013a

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 90 (30/30/30) Demographics: 45-80 years, 57% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 1-3 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	3 arms:
	
	• routine acupuncture + OT + WM
	• acupuncture kinesitherapy simultaneously + OT + WM
	• OT + WM
	
	Comparisons eligible:
	
	• routine acupuncture + OT + WM versus OT + WM
	• acupuncture kinesitherapy simultaneously + OT + WM versus OT + WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: scalp acupoints
	  ◦ Numbers of points used: 7 points
	  ◦ Depths of insertion: 0.66-1.57 inches
	  ◦ Deqi elicited: not stated
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: length 1.57 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 30 sessions
	  ◦ Frequency of treatment: 5 sessions/week
	  ◦ Total course: 6 weeks
	• Practitioner background: not stated
	• Co-intervention: OT + WM

Wu 2013a *(Continued)*

	Control interventions: OT + WM
Outcomes	• Improvement of swallowing function (Water drinking test) • FU: 6 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Xu 2013

Methods	RCT Method of randomisation: not stated Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 140 (70/70) Demographics: 45-75 years, 47% male Type of stroke: unclear Diagnosis: WHO definition and all confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 1-12 months

Xu 2013 *(Continued)*

	Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 4 scalp acupoints and 16 body acupoints
	  ◦ Depths of insertion: 1.18-1.97 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: stainless steel needle, length 1.97 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 80 sessions
	  ◦ Frequency of treatment: 2 sessions/day
	  ◦ Total course: 40 days
	• Practitioner background: not stated
	• Co-intervention: WM
	
	Control interventions: WM

Outcomes	• Improvement of swallowing function (Water drinking test) • FU: 40 days
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported

Xu 2013 *(Continued)*

Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Yao 2014

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 90 (30/30/30) Demographics: 54% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 1-12 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison eligible:
	
	• routine acupuncture + PT versus PT only
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 15 points
	  ◦ Depths of insertion: not stated
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual and electrical
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: stainless steel needle, length 1.57 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 24 sessions
	  ◦ Frequency of treatment: 3 sessions/week
	  ◦ Total course: 8 weeks
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of motor function (Fugl-Meyer Motor Assessment) • Improvement of neurological function (Neurological Deficit Score) • Improvement of independence (Barthel Index) • Improvement of pain (Visual Analogue Score) • FU: 8 weeks

Yao 2014 *(Continued)*

Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Zhan 2014

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: none
Participants	Country: China Number of participants included: 130 (65/65) Demographics: aged 45-75 years, 59% male Type of stroke: unclear Diagnosis: WHO definition Severity on entry: not stated Time from stroke onset: 2-11 months Setting: inpatient and outpatient Comparability: no significant difference in age or time post onset
Interventions	Comparison: acupuncture + PT versus PT

Zhan 2014 *(Continued)*

	Acupuncture treatment
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: body acupoints
	  ○ Numbers of points used: 8 points
	  ○ Depths of insertion: not stated
	  ○ Deqi elicited: not stated
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 15-20 minutes
	  ○ Needle type: not stated
	• Treatment regimen
	  ○ Number of treatment sessions: 6 sessions
	  ○ Frequency of treatment: 6 sessions/week
	  ○ Total course: 1 week
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of independence (Barthel Index) • FU: 1 week
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	No participants withdrew or were lost to follow-up
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Zhang 2013a

Methods	RCT Method of randomisation: closed envelopes Blinding: Investigators, participants, not blinded Adverse effects: not stated ITT analysis: none Losses to FU: not stated
Participants	Country: China Number of participants included: 90 (30/30/30) Demographics: 43-75 years, 54% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition and all confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 6-19 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	3 arms:
	
	• acupuncture only
	• WM only
	• acupuncture + WM
	
	Comparison eligible: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: scalp acupoints
	  ◦ Numbers of points used: 4 acupoints
	  ◦ Depths of insertion: 0.66-1.05 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual and electrical
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: hua tuo brand, length 0.98 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 30 sessions
	  ◦ Frequency of treatment: 5 sessions/week
	  ◦ Total course: 6 weeks
	• Practitioner background: not stated
	• Co-intervention: WM
	
	Control interventions: WM

Outcomes	• Improvement of depression (Hamilton Depression Scale) • Improvement of sleep (Rhone Planck Sleepiness Scale) • Adverse event • FU: 6 weeks
Notes	-
Risk of bias	

Zhang 2013a *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using closed envelopes
Allocation concealment (selection bias)	Low risk	Randomisation by using closed envelopes
Blinding (performance bias and detection bias) All outcomes	High risk	Quote: "unable to blind to participants and operators"
Blinding of participants and personnel (performance bias) All outcomes	High risk	Quote: "unable to blind to participants and operators"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Details not given
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Some patient-related outcomes were not reported, such as information on quality of life or all-cause mortality
Other bias	Unclear risk	No information provided

Zhang 2015

Methods	RCT Method of randomisation: random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 90 (30/30/30) Demographics: 66% male Type of stroke: ischaemic only Diagnosis: CT/MRI Severity on entry: not stated Time from stroke onset: 2-6 months Setting: inpatient Comparability: no significant difference in age or time post onset
Interventions	3 arms: • acupuncture only • PT only • acupuncture + PT Comparison eligible: acupuncture + PT versus PT only

Zhang 2015 *(Continued)*

	Acupuncture treatment
	• Acupuncture rationale: not stated
	• Needling details
	  ○ Points used: scalp acupoints
	  ○ Numbers of points used: 3 points
	  ○ Depths of insertion: 0.98-1.18 inches
	  ○ Deqi elicited: not stated
	  ○ Needle stimulation: manual
	  ○ Needle retention time: 30 minutes
	  ○ Needle type: length 1.57 inches
	• Treatment regimen
	  ○ Number of treatment sessions: 24 sessions
	  ○ Frequency of treatment: 6 sessions/week
	  ○ Total course: 4 weeks
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of neurological function (Modified Edinburgh And Scandinavia Stroke Scale) • Improvement of independence (Barthel Index) • FU: 4 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events

Zhang 2015 *(Continued)*

Other bias	Unclear risk	No information provided

Zheng 2014

Methods	RCT Method of randomisation: randomisation by using random number table Blinding: not stated Adverse effects: not stated ITT analysis: not stated Losses to FU: none
Participants	Country: China Number of participants included: 60 (30/30) Demographics: aged 51-79 years, 60% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition Severity on entry: not stated Time from stroke onset: 1-6 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + WM versus WM
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 2 scalp acupoints and 5 body acupoints
	  ◦ Depths of insertion: 0.39-1.97 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: hua tuo brand, length 1.57 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 48 sessions
	  ◦ Frequency of treatment: 6 sessions/week
	  ◦ Total course: 8 weeks
	• Practitioner background: not stated
	• Co-intervention: WM
	
	Control interventions: WM

Outcomes	• Improvement of cognitive function (MMSE, MoCA) • Improvement of independence (Barthel Index) • FU: 8 weeks
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement

Zheng 2014 *(Continued)*

Random sequence generation (selection bias)	Low risk	Randomisation by using random number table
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Quote: "No participants lost to follow-up"
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

Zhou 2014

Methods	RCT Method of randomisation: closed envelopes Blinding: Investigators but not participants blinded Adverse effects: 20 ITT analysis: not stated Losses to FU: none
Participants	Country: China Number of participants included: 147 (75/72) Demographics: aged 35-80 years, 54% male Type of stroke: ischaemic only Diagnosis: WHO definition and all confirmed by CT/MRI Severity on entry: not stated Time from stroke onset: 1-3 months Setting: inpatient Comparability: no significant difference in age or time post onset

Interventions	Comparison: acupuncture + daily PT versus daily PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 8 scalp acupoints and 9 body acupoints

Zhou 2014 *(Continued)*

	○ Depths of insertion: 1.18-1.38 inches ○ Deqi elicited: not stated ○ Needle stimulation: manual and electrical ○ Needle retention time: 6-8 hours/30 minutes ○ Needle type: hua tuo brand, length 1.57 inches • Treatment regimen ○ Number of treatment sessions: 40 sessions ○ Frequency of treatment: 5 sessions/week ○ Total course: 8 weeks • Practitioner background: not stated • Co-intervention: PT Control interventions: PT
Outcomes	• Improvement of depression (HAMD) • Improvement of neurological function (NIHSS) • Improvement of independence (Barthel Index) • Improvement of motor function (Fugl-Meyer scale) • Adverse event: bleeding, haematoma, and pain
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation by using closed envelopes
Allocation concealment (selection bias)	Low risk	Randomisation by using closed envelopes
Blinding (performance bias and detection bias) All outcomes	Low risk	Investigators blinded
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Details not given
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessors blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	Treatment: no participants lost to follow-up Control: 3 participants lost to follow-up
Selective reporting (reporting bias)	Unclear risk	Some patient-related outcomes were not reported, such as information on quality of life or all-cause mortality
Other bias	Unclear risk	No information provided

Zhu 2007

Methods	RCT Method of randomisation: not stated Blinding: not stated ITT analysis: not stated Losses to FU: not stated
Participants	Country: China Number of participants included: 60 (30/30) Demographics: aged 45-69 years, 53% male Type of stroke: both ischaemic and haemorrhagic strokes Diagnosis: WHO definition Severity on entry: not stated Time from stroke onset: 1-6 months Setting: inpatient Comparability: no significant difference in age, comorbidity, or time post onset

Interventions	Comparison: acupuncture + PT versus PT
	
	Acupuncture treatment
	
	• Acupuncture rationale: not stated
	• Needling details
	  ◦ Points used: both body and scalp acupoints
	  ◦ Numbers of points used: 2 scalp acupoints and 4 body acupoints
	  ◦ Depths of insertion: 1.57 inches
	  ◦ Deqi elicited: yes
	  ◦ Needle stimulation: manual and electrical stimulation
	  ◦ Needle retention time: 30 minutes
	  ◦ Needle type: length 1.57 inches
	• Treatment regimen
	  ◦ Number of treatment sessions: 24 sessions
	  ◦ Frequency of treatment: 6 sessions/week
	  ◦ Total course: 4 weeks
	• Practitioner background: not stated
	• Co-intervention: PT
	
	Control interventions: PT

Outcomes	• Improvement of neurological function (Modified Edinburgh Stroke Scale and Scandinavian Stroke Scale)
Notes	-

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation was not reported
Allocation concealment (selection bias)	Unclear risk	Information on allocation concealment was not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Information on blinding was not reported

Zhu 2007 *(Continued)*

Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Information on blinding was not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information on blinding was not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Information on attrition was not reported
Selective reporting (reporting bias)	Unclear risk	Free of selective reporting bias was assessed as 'unclear' due to some clinically important outcomes unstated, such as quality of life, mortality and adverse events
Other bias	Unclear risk	No information provided

BMIT: Boston Motor Inventory Test
CSRS 1: Chinese Stroke Recovery Scale based on the revised diagnostic criteria of acute cerebral infarction formulated by the second National Academic Symposium on Cerebrovascular Diseases of the Chinese Medical Association in 1986, which is similar to the Revised Scandinavian Stroke Scale (RSSS)
CSRS 2: Chinese Stroke Recovery Scale based on principles of traditional Chinese medicine
CT: computerised tomography
FU: follow-up
HAMD: Hamilton Depression Scale
ITT: intention-to-treat
LOTCA: Loewenstein Occupational Therapy Cognitive Assessment
MESS: modified Edinburgh Stroke Scale
MMSE: Mini Mental State Examination
MoCA: Montreal Cognitive Assessment Scale
MRI: magnetic resonance imaging
OT: occupational therapy
PT: physical therapy
qd: once per day
RCT: randomised controlled trial
SF-36: 36-Item Short Form Health Survey
SS-QOL: Stroke Specific Quality of Life Scale
SSS: Scandinavian Stroke Scale
TCM: Traditional Chinese Medicine
WHO: World Health Organization
WM: Western medicine

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Bai 2007	The trial included people with stroke less than 1 month since onset
Bai 2011	The trial included people with stroke less than 1 month since onset
Bai 2013	The trial included people with stroke less than 1 month since onset although the median time to post-stroke was more than 1 month
Bao 2008	The duration of stroke since onset was not stated in the trial

Study	Reason for exclusion
Bao 2010	The duration of stroke since onset was not clear
Bao 2012a	The trial included people with stroke less than 1 month since onset
Cai 2010	The trial included people with stroke less than 1 month since onset
Calabro 2011	Abstract only; clarification of randomisation and intervention sought but not obtained
Cao 2010a	The trial included people with stroke less than 1 month since onset
Cao 2010b	Not RCT
Chang 2010	The trial included people with stroke less than 1 month since onset
Chao 2009	The trial included people with stroke less than one month since onset
Chau 2009	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Che 2002	The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Chen 2000	Confounded; the trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Chen 2007	The trial included people with stroke less than 1 month since onset
Chen 2008a	The duration of stroke since onset was not clear
Chen 2008b	Stroke population not randomised to treatment: quasi-randomisation of particpants (based on administrative procedure) to 1 of 2 groups
Chen 2009	The trial included people with stroke less than 1 month since onset
Chen 2010a	The trial included people with stroke less than 1 month since onset
Chen 2010b	The duration of stroke since onset was not clear
Chen 2012a	The trial included people with stroke less than 1 month since onset
Chen 2012b	The trial included people with stroke less than 1 month since onset
Chen 2013	The trial included people with acute stroke (less than 1 month since onset)
Chen 2014	The trial included people with stroke less than 1 month since onset
Cheng 2006	The duration of stroke since onset was not stated in the trial
Cheng 2007	The duration of stroke since onset was not stated in the trial
Cheng 2011	It was not possible to include data from this trial in the analysis. Stroke population not randomised to treatment: quasi-randomisation of particpants (based on administrative procedure) to 1 of 2 groups

Study	Reason for exclusion
Chow 2006	Abstract only; clarification of randomisation and intervention sought but not obtained
Chu 2007	The trial included people with stroke less than 1 month since onset
Chu 2009	The trial included people with stroke less than 1 month since onset
Cui 1992	It was not possible to include data from this trial in the analysis; this confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Ding 2000	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Dong 2007a	The trial included people with acute stroke (less than 1 month since onset)
Dong 2007b	The duration of stroke since onset was not clear
Dong 2008a	The trial included people with acute stroke (less than 1 month since onset)
Dong 2008b	The trial included people with acute stroke (less than 1 month since onset)
Dong 2009	The trial included people with stroke less than 1 month since onset
Du 2013	The duration of stroke since onset was not stated in the trial
Duan 2010	The trial included people with stroke less than 1 month since onset
Duan 2014	The duration of stroke since onset was not clear
Fang 2009	The duration of stroke since onset was not stated in the trial
Feng 1996a	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Feng 1996b	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Feng 2011	The trial included people with stroke less than 1 month since onset
Fink 2004	It was not possible to include data from this trial in the analysis. MAS scores (as a clinical measure of spasticity) were assessed before and after the treatment period but mean change of neurological score after the treatment period was not available
Fu 2010	The trial included people with stroke less than 1 month since onset
Fu 2013	The trial included people with stroke less than 1 month since onset
Fu 2014	The trial included people with stroke less than 1 month since onset
Gao 2001	It was not possible to include data from this trial in the analysis. This confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Gao 2008	The duration of stroke since onset was not stated in the trial

Study	Reason for exclusion
Gao 2011	The duration of stroke since onset was not clear
Gao 2014b	The trial included people with stroke less than 1 month since onset
Gong 2008	The trial included people with stroke less than 1 month since onset
Gu 2007	The trial included people with acute stroke (less than 1 month since onset)
Gu 2009	The trial included people with stroke less than 1 month since onset
Guan 2009a	It was not possible to include data from this trial in the analysis. Stroke population not randomised to treatment: quasi-randomisation of particpants (based on administrative procedure) to 1 of 2 groups
Guan 2009b	Quasi-randomised study
Guan 2013	The trial included people with stroke less than 1 month since onset
Guo 1999	The trial aimed to assess effects of acupuncture only compared with PT and OT
Guo 2006a	The trial included people with stroke less than 1 month since onset
Guo 2006b	The trial included people with stroke less than 1 month since onset
Guo 2013	The trial included people with stroke less than 1 month since onset
Han 2008	The trial included people with stroke less than 1 month since onset
Han 2010	The trial included people with stroke less than 1 month since onset
Han 2011	The trial included people with stroke less than 1 month since onset
Han 2012	The duration of stroke since onset was not stated in the trial
Han 2014	Quasi-randomised study
Hang 2014	The trial included people with stroke less than 1 month since onset
He 2008	The trial included people with stroke less than 1 month since onset
Hegyi 2012	The trial included people with stroke less than 1 month since onset
Hong 2013	The duration of stroke since onset was not clear
Hou 1998	The trial aimed to assess the effects of the combination of acupuncture, oxygen and herbs compared with acupuncture or oxygen respectively
Hsing 2012	The trial aimed to assess effects of electrical acupuncture compared with routine acupuncture
Hu 2011	The duration of stroke since onset was not stated in the trial
Hu 2012	The trial included people with stroke less than 1 month since onset
Huang 2002	It was not possible to include data from this trial in the analysis; this confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)

Study	Reason for exclusion
Huang 2008b	The duration of stroke since onset was not clear
Huang 2008c	The duration of stroke since onset was not clear
Huang 2011	The trial included people with stroke less than 1 month since onset
Huang 2012	The trial included people with stroke less than 1 month since onset
Huang 2014	The duration of stroke since onset was not clear
Jia 2012	The trial included people with stroke less than 1 month since onset
Jiang 1998	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Jiang 2000	It was not possible to include data from this trial in the analysis; this confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Jiang 2006	The trial included people with stroke less than 1 month since onset
Jiang 2009	The trial included people with stroke less than 1 month since onset
Jiang 2010	The duration of stroke since onset was not stated in the trial
Jiang 2011a	The duration of stroke since onset was not clear
Jiang 2011b	The trial included people with stroke less than 1 month since onset
Jiang 2012	The trial included people with stroke less than 1 month since onset
Jiang 2013	The trial included people with stroke less than 1 month since onset
Jin 1993	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Jin 2010a	Quasi-randomised study
Jin 2010b	The duration of stroke since onset was not stated in the trial
Kang 2011	The trial included people with stroke less than 1 month since onset
Kang 2013	The trial included people with stroke less than 1 month since onset
Kjendahl 1997	The trial included people with stroke less than 1 month since onset although the median time to post-stroke was more than 1 month
Lai 1997a	It was not possible to include data from this trial in the analysis; this confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Lai 1997b	The trial aimed to assess the effects of electrical acupuncture compared with manual acupuncture. Acupoints were the same between the 2 groups

Study	Reason for exclusion
Lai 1998	The trial aimed to assess the effects of electrical acupuncture compared with manual acupuncture. Acupoints were the same between 2 groups
Lai 2004	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Lai 2011	The duration of stroke since onset was not clear
Lang 2013	The trial included people with stroke less than 1 month since onset
Lao 2013	The trial included people with stroke less than 1 month since onset
Lee 2007	The full-text with English or Chinese language was not available
Lee 2009	The duration of stroke since onset was not stated in the trial
Lei 2013	The trial included people with stroke less than 1 month since onset
Li 1993	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Li 1994a	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Li 1994b	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Li 1997b	No outcome measures of interest were available in the trial, which aimed to assess the effects of acupuncture on the change of intellectual disturbance in people with vascular dementia caused by cerebrovascular disease
Li 2006a	The trial included people with stroke less than 1 month since onset
Li 2006b	The trial included people with stroke less than 1 month since onset
Li 2006c	The trial included people with stroke less than 1 month since onset
Li 2006d	The trial included people with stroke less than 1 month since onset
Li 2006e	The trial included people with stroke less than 1 month since onset
Li 2008a	The trial included people with acute stroke (less than 1 month since onset)
Li 2008b	The duration of stroke since onset was not clear
Li 2008c	The trial included people with stroke less than 1 month since onset
Li 2008d	The trial included people with stroke less than 1 month since onset
Li 2009a	The trial included people with stroke less than 1 month since onset
Li 2009b	The trial included people with stroke less than 1 month since onset

Study	Reason for exclusion
Li 2010b	The trial included people with stroke less than 1 month since onset
Li 2010c	The trial aimed to assess the effects of the combination of acupuncture and PT compared with PT. The duration of stroke since onset was not stated in the trial
Li 2011b	The trial included people with stroke less than 1 month since onset
Li 2011c	The trial included people with stroke less than 1 month since onset
Li 2011d	The trial included people with acute stroke (less than 1 month since onset)
Li 2012a	The duration of stroke since onset was not stated in the trial
Li 2012b	The duration of stroke since onset was not stated in the trial
Li 2012c	The trial included people with stroke less than 1 month since onset
Li 2012d	Quasi-randomised study
Li 2012e	The duration of stroke since onset was not clear
Li 2012f	The trial included people with stroke less than 1 month since onset although the median time to post-stroke was more than 1 month
Li 2012g	The duration of stroke since onset was not stated in the trial
Li 2013b	The trial included people with stroke less than 1 month since onset. Stroke population not randomised to treatment: quasi-randomisation of particpants (based on administrative procedure) to 1 of 2 groups
Li 2013c	The trial included people with stroke less than 1 month since onset
Li 2014	The trial included people with stroke less than 1 month since onset
Li 2015	The trial included people with stroke less than 1 month since onset
Liang 1993	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Liang 2010	Quasi-randomised study
Liang 2012	The trial included people with stroke less than 1 month since onset
Liao 2006a	The duration of stroke since onset was not clear
Liao 2006b	The duration of stroke since onset was not stated in the trial
Liao 2013	The trial included people with stroke less than 1 month since onset
Liao 2014	The duration of stroke since onset was not clear
Lim 2014	Review
Lin 2010a	The trial included people with stroke less than 1 month since onset

Study	Reason for exclusion
Lin 2010b	The duration of stroke since onset was not stated in the trial
Lin 2012	The duration of stroke since onset was not clear
Lin 2013	The trial included people with stroke less than 1 month since onset
Liu 1998	It was not possible to include data from this trial in the analysis. ADL was assessed before and after the treatment period but the number of participants who were independent after the treatment period was not available. The trial primarily aimed to assess the effects of acupuncture on the intellectual disturbance in people with vascular dementia due to stroke
Liu 2004a	The trial included people with stroke less than 1 month since onset (that is, acute stroke)
Liu 2004b	Confounded (acupuncture plus 1 type of Chinese herbs versus another type of Chinese herbs
Liu 2006	The trial included people with acute stroke (less than 1 month since onset)
Liu 2008a	The trial included people with stroke less than 1 month since onset
Liu 2008b	Non-randomised controlled study
Liu 2009	The trial included people with stroke less than 1 month since onset
Liu 2010a	The trial included people with stroke less than 1 month since onset
Liu 2010b	The trial included people with stroke less than 1 month since onset
Liu 2011a	The duration of stroke since onset was not stated in the trial
Liu 2011b	The trial included people with stroke less than 1 month since onset
Liu 2012a	The trial included people with stroke less than 1 month since onset
Liu 2012b	The duration of stroke since onset was not clear
Liu 2012c	The trial included people with stroke less than 1 month since onset
Liu 2013c	The trial included people with stroke less than 1 month since onset
Liu 2013d	The duration of stroke since onset was not clear
Liu 2013e	The duration of stroke since onset was not stated in the trial
Liu 2013f	The duration of stroke since onset was not stated in the trial
Liu 2014b	The trial included people with stroke less than 1 month since onset
Liu 2015	The duration of stroke since onset was not clear
Long 2013	The duration of stroke since onset was not stated in the trial
Lu 2010	The trial included people with stroke less than 1 month since onset
Lu 2011a	The trial included people with stroke less than 1 month since onset

Study	Reason for exclusion
Lu 2011b	The duration of stroke since onset was not stated in the trial
Luo 2007	The trial included people with stroke less than 1 month since onset
Luo 2008	The trial included people with stroke less than 1 month since onset
Luo 2012	The duration of stroke since onset was not stated in the trial
Lv 2009	The trial included people with stroke less than 1 month since onset
Lv 2014	The trial included people with stroke less than 1 month since onset
Ma 2011a	The trial included people with acute stroke (less than 1 month since onset)
Ma 2011b	The trial included people with stroke less than 1 month since onset
Ma 2013	The trial included people with stroke less than 1 month since onset
Mou 2010	The trial included people with stroke less than 1 month since onset
Mu 2007	The duration of stroke since onset was not stated in the trial
Mukherjee 2006	Abstract only; clarification of randomisation and intervention sought but not obtained
Muo 2001	It was not possible to include data from this trial in the analysis. This confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Ni 2011	The trial included people with stroke less than 1 month since onset
Nie 2011	The trial included people with stroke less than 1 month since onset
Nie 2013	The duration of stroke since onset was not stated in the trial
Pan 2013	The duration of stroke since onset was not stated in the trial
Pang 2010	Not RCT
Peng 2007a	The trial aimed to assess the effects of the combination of acupuncture, PT and WM compared with WM. The duration of stroke since onset was not stated in the trial
Peng 2009	The trial included people with stroke less than 1 month since onset
Peng 2015	The duration of stroke since onset was not stated in the trial
Qi 2000	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Qi 2013	The trial included people with stroke less than 1 month since onset
Qi 2013a	The trial included people with stroke less than 1 month since onset
Qiao 2012	Abstract only; clarification of randomisation and intervention sought but not obtained
Qiu 2011	Quasi-randomised study

Study	Reason for exclusion
Qu 1991	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Ran 2013	The trial included people with stroke less than 1 month since onset
Ren 2009	The duration of stroke since onset was not stated in the trial
Ren 2010	The trial included people with acute stroke (less than 1 month since onset)
Ren 2012	The trial included people with stroke less than 1 month since onset
Sallstrom 1996	The median time to post-stroke was more than 1 month, but the trial included people with acute stroke (that is, less than 1 month)
Salom-Moreno 2014	The duration of stroke since onset was not stated in the trial
Schaechter 2007	The duration of stroke since onset was not stated in the trial
Seo 2013	The trial aimed to assess the effects of ouhyul herbal acupuncture point injection compared with normal saline acupuncture point injection
Shang 2008	Quasi-randomised study
Shao 2012	The duration of stroke since onset was not clear
Shen 2008	The trial included people with stroke less than 1 month since onset
Shen 2009	The trial included people with stroke less than 1 month since onset
Sheng 2011	The trial included people with stroke less than 1 month since onset
Sheng 2013	The duration of stroke since onset was not clear
Shi 2007	The trial aimed to assess the effects of combination of acupuncture, PT and WM compared with WM
Shi 2007a	The trial included people with stroke less than 1 month since onset
Song 2010	Not stroke
Sui 2001	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Sun 2008	Abstract only; clarification of randomisation and intervention sought but not obtained
Sun 2010	The duration of stroke since onset was not clear
Sun 2011	Not RCT
Sun 2013b	The duration of stroke since onset was not stated in the trial
Sun 2014	The trial included people with stroke less than 1 month since onset

Study	Reason for exclusion
Suo 2008	The trial aimed to assess the effects of combination of sham acupuncture and PT compared with acupuncture only
Tang 2005	The trial included people with stroke less than 1 month since onset
Tang 2012	The trial included people with stroke less than 1 month since onset
Tang 2013	The trial included people with stroke less than 1 month since onset
Tang 2013a	The trial aimed to assess the effects of combination of acupuncture and WM compared with combination of WM and PT
Tian 2014	The trial included people with stroke less than 1 month since onset
Tong 1997	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Tong 2013	The trial included people with stroke less than 1 month since onset
Tong 2014	The trial included people with stroke less than 1 month since onset
Wan 2013	The duration of stroke since onset was not clear in the trial
Wang 2004	Randomisation was not stated; the trial included people with acute stroke (less than 1 month since onset)
Wang 2006	The trial included people with stroke less than 1 month since onset
Wang 2007	The trial included people with stroke less than 1 month since onset
Wang 2008	The trial included people with stroke less than 1 month since onset
Wang 2008a	The trial included people with stroke less than 1 month since onset
Wang 2008b	The trial included people with acute stroke (less than 1 month since onset)
Wang 2009	Quasi-randomised study
Wang 2010a	The duration of stroke since onset was not clear
Wang 2010b	The duration of stroke since onset was not clear
Wang 2011b	The trial included people with stroke less than 1 month since onset
Wang 2011c	The trial included people with stroke less than 1 month since onset
Wang 2011d	The duration of stroke since onset was not clear
Wang 2011e	The trial included people with stroke less than 1 month since onset
Wang 2011f	The duration of stroke since onset was not clear
Wang 2011g	The trial included people with stroke less than 1 month since onset

Study	Reason for exclusion
Wang 2011h	The trial included people with stroke less than 1 month since onset
Wang 2011i	The trial included people with stroke less than 1 month since onset
Wang 2011j	The trial included people with stroke less than 1 month since onset
Wang 2013	The duration of stroke since onset was not stated in the trial
Wang 2014a	The trial aimed to assess the effects of acupuncture compared with transcutaneous electrical acupoint stimulation
Wang 2014b	The duration of stroke since onset was not stated in the trial
Wei 2005	The trial included people with ischaemic stroke less than 1 month since onset (that is, acute stroke). Data for participants with haemorraghic stroke more than 150 days were not separated from data for participants with ischaemic stroke
Wei 2009	The trial included people with stroke less than 1 month since onset
Wenli 2007	The trial included people with stroke less than 1 month since onset
Wong 2013	Abstract only; clarification of randomisation and intervention sought but not obtained
Wu 1999	Data on pre-planned outcome measures of interest were not available from the trial, which aimed to assess the effects of acupuncture on urinary incontinence in people with stroke
Wu 2009a	The trial included people with stroke less than 1 month since onset
Wu 2009b	The trial aimed to assess the effects of three different forms of acupuncture
Wu 2010	The trial included people with acute stroke (less than 1 month since onset)
Wu 2011	The trial included people with stroke less than 1 month since onset
Wu 2012	The duration of stroke since onset was not clear
Wu 2012a	The trial included people with acute stroke (less than 1 month since onset)
Wu 2013b	The trial included people with acute stroke (less than 1 month since onset)
Wu 2014a	The trial included people with acute stroke (less than 1 month since onset)
Wu 2014b	The duration of stroke since onset was not clear
Xia 2008	The trial included people with stroke less than 1 month since onset
Xia 2010	The trial included people with stroke less than 1 month since onset
Xiao 1996	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Xiao 2006	The trial included people with stroke less than 1 month since onset
Xiao 2008	The trial included people with acute stroke (less than 1 month since onset)

Study	Reason for exclusion
Xiao 2011	The trial included people with acute stroke (less than 1 month since onset)
Xie 2010	The trial included people with stroke less than 1 month since onset
Xie 2012	The trial included people with stroke less than 1 month since onset
Xie 2013	Quasi-randomised study
Xing 2007	The trial included people with stroke less than 1 month since onset
Xu 2009a	The duration of stroke since onset was not stated in the trial
Xu 2009b	The duration of stroke since onset was not stated in the trial
Xu 2010	The trial included people with acute stroke (less than 1 month since onset)
Xu 2013a	The trial included people with stroke less than 1 month since onset
Xu 2014	The duration of stroke since onset was not clear
Yan 2010	The duration of stroke since onset was not clear
Yan 2011	The trial included people with stroke less than 1 month since onset
Yang 2006	The duration of stroke since onset was not clear
Yang 2007a	Quasi-randomised study
Yang 2007b	The trial included people with stroke less than 1 month since onset
Yang 2007c	The trial included people with stroke less than 1 month since onset
Yang 2008	The trial aimed to assess the effects of electrical acupuncture compared with routine acupuncture
Yang 2009	The duration of stroke since onset was not clear
Yang 2010	The trial included people with stroke less than 1 month since onset
Yang 2011a	The trial included people with stroke less than 1 month since onset
Yang 2011b	The duration of stroke since onset was not clear
Yang 2011c	The duration of stroke since onset was not clear
Yang 2012	The trial included people with stroke less than 1 month since onset
Yang 2014	The duration of stroke since onset was not clear
Yang 2014a	The duration of stroke since onset was not clear
Yang 2015	The trial included people with stroke less than 1 month since onset
Yao 2006	The duration of stroke since onset was not stated in the trial
Yao 2013a	The trial included people with stroke less than 1 month since onset

Study	Reason for exclusion
Yao 2013b	The trial included people with acute stroke (less than 1 month since onset)
Yin 2013a	The trial included people with acute stroke (less than 1 month since onset)
Yin 2013b	The trial included people with stroke less than 1 month since onset
Yin 2014	The duration of stroke since onset was not clear
You 2011	The trial included people with stroke less than 1 month since onset
You 2014	The trial included people with stroke less than 1 month since onset
Yu 2002	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups. The trial was also confounded; it aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Yu 2007	The trial included people with stroke less than 1 month since onset
Yu 2009	The trial included people with stroke less than 1 month since onset
Yu 2011	Abstract only; clarification of randomisation and intervention sought but not obtained
Yuan 2010	The trial included people with stroke less than 1 month since onset
Zeng 2010	The trial included people with stroke less than 1 month since onset
Zhang 1988	It was not possible to include data from this trial in the analysis. This confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Zhang 1997	It was not possible to include data from this trial in the analysis. This confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Zhang 2002a	The trial aimed to assess the effects of magnetic acupuncture compared with routine acupuncture. Acupoints were similar between the 2 groups
Zhang 2002b	The duration of stroke since onset was not stated in the trial; it was not possible to include data from this trial in the analysis. This confounded trial aimed to assess effects of acupuncture only compared with drug therapy (such as WM or TCM)
Zhang 2007a	The trial included people with stroke less than 1 month since onset
Zhang 2007b	The trial aimed to assess the effects of the combination of acupuncture, buyang huanwu decoction and routine treatment compared with routine treatment
Zhang 2008	The trial included people with stroke less than 1 month since onset
Zhang 2009b	The trial included people with stroke less than 1 month since onset
Zhang 2009c	The duration of stroke since onset was not stated in the trial
Zhang 2010a	The trial aimed to assess the effects of basic therapy, rehabilitation, acupuncture, TCM, and massage therapy compared with basic treatment and rehabilitation treatment
Zhang 2010b	The trial included people with acute stroke (less than 1 month since onset)

Study	Reason for exclusion
Zhang 2010c	The trial included people with acute stroke (less than 1 month since onset)
Zhang 2010d	The trial included people with stroke less than 1 month since onset
Zhang 2010e	The duration of stroke since onset was not clear
Zhang 2010f	The trial included people with acute stroke (less than 1 month since onset)
Zhang 2011a	The trial included people with stroke less than 1 month since onset
Zhang 2011b	The duration of stroke since onset was not stated in the trial
Zhang 2011c	The duration of stroke since onset was not stated in the trial
Zhang 2011d	The trial included people with stroke less than 1 month since onset
Zhang 2011e	The duration of stroke since onset was not clear
Zhang 2012b	The trial included people with stroke less than 1 month since onset
Zhang 2012c	The trial included people with stroke less than 1 month since onset
Zhang 2012d	The trial included people with stroke less than 1 month since onset
Zhang 2012e	The trial included people with stroke less than 1 month since onset
Zhang 2013b	The trial included people with stroke less than 1 month since onset
Zhang 2014b	Abstract only; clarification of randomisation and intervention sought but not obtained
Zhang 2014c	The duration of stroke since onset was not clear
Zhang 2014d	The trial included people with stroke less than 1 month since onset
Zhao 2008	The duration of stroke since onset was not stated in the trial
Zhao 2009	The trial aimed to assess the effects of deep acupuncture compared with routine acupuncture. Acupoints were the same between 2 groups
Zhao 2010	The duration of stroke since onset was not stated in the trial
Zhao 2011a	The duration of stroke since onset was not clear
Zhao 2011b	The trial included people with acute stroke (less than 1 month since onset)
Zhao 2014a	The trial included people with stroke less than 1 month since onset
Zhao 2014b	The duration of stroke since onset was not stated in the trial
Zheng 1996	The trial aimed to assess the effects of combination of body and scalp acupuncture compared with body acupuncture only or scalp acupuncture only
Zheng 2000	Confounded (acupuncture plus Chinese herbs versus WM only)
Zheng 2011b	The trial aimed to assess the effects of different forms of acupuncture

Study	Reason for exclusion
Zheng 2011c	The trial included people with stroke less than 1 month since onset
Zhong 2014	The trial included people with stroke less than 1 month since onset
Zhou 1995	It was not possible to include data from this trial in the analysis. The trial aimed to assess effects of 2 methods of acupuncture on subacute or chronic stroke. Acupoints were different between the 2 groups
Zhou 2008	The trial aimed to assess the effects of combination of acupuncture, PT and WM compared with WM. The duration of stroke since onset was not stated in the trial
Zhu 2010a	The duration of stroke since onset was not stated in the trial
Zhu 2010b	The duration of stroke since onset was not stated in the trial
Zhu 2011	Abstract only; clarification of randomisation and intervention sought but not obtained
Zhu 2012a	The trial included people with stroke less than 1 month since onset
Zhu 2012b	The duration of stroke since onset was not stated in the trial
Zhuang 2012	The trial included people with stroke less than 1 month since onset

ADL: activities of daily living
MAS: Modified Ashworth Scale
OT: occupational therapy
PT: physical therapy
TCM: Traditional Chinese Medicine
WM: Western medicine

Characteristics of ongoing studies *[ordered by study ID]*

Fu 2011

Trial name or title	Randomised, controlled Phase III trial to evaluate the efficacy and safety of comprehensive acupuncture treatment programmes for post-stroke motor rehabilitation
Methods	Randomised parallel controlled trial
Participants	People with haemorrhagic or ischaemic stroke
Interventions	Acupuncture + rehabilitation training
Outcomes	• BOSS • Fugl-Meyer Motor Assessment
Starting date	1 January 2011
Contact information	Shanghai Municipal Health Bureau
Notes	Recruiting status：completed

Liu 2013b

Trial name or title	Acupuncture based on five elements body characteristics in the treatment of people with post-stroke depression
Methods	Randomised parallel controlled trial
Participants	People with post-stroke depression
Interventions	• Five pedestrian body dialectical acupuncture • Conventional acupuncture
Outcomes	• HAMD • ADL • Neurologic function score
Starting date	1 July 2013
Contact information	The First Affiliated Hospital of Guangxi Traditional Chinese Medicine University
Notes	Recruiting status

Xie 2006

Trial name or title	Randomised controlled study on the acupuncture for dysphagia in convalescence phase of apoplexy
Methods	Parallel RCT
Participants	People with dysphagia in the convalescent phase of apoplexy
Interventions	Acupuncture with swallowing training
Outcomes	• Mortality • Improvement • Neurological function scale • Length of hospitalisation • Nutrition status • Quality of life • TCM outcomes • Rate of Lung Infection • Loss of follow-up, and withdraw • Adverse events
Starting date	1 October 2006
Contact information	Department of Acupuncture, Huguosi TCM Hospital attached to the Beijing University of TCM
Notes	Date last refreshed: 7 February 2015

Zhong 2010

Trial name or title	The research of linguistic functional recovery mechanism based on fMRI after electroacupuncture at acupoints Tongli (HT5) and Xuanzhong (GB39) curing basal ganglia aphasia after stroke
Methods	Randomised parallel controlled trial
Participants	People who have explicit syndrome of aphasia, presenting within ischaemic stroke only in basal ganglia
Interventions	Electroacupuncture
Outcomes	• Linguistic functional evaluation after 30 days' and 60 days' therapy • fMRI after 30 days' and 60 days' therapy
Starting date	1 January 2010
Contact information	State Administration of Traditional Chinese Medicine
Notes	Recruiting status：completed

ADL: activities of daily living
BOSS: Burden of Stroke Scale
fMRI: functional magnetic resonance imaging
HAMD: Hamilton Depression Scale
TCM: traditional Chinese medicine

DATA AND ANALYSES

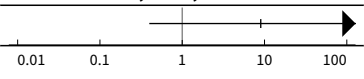
Comparison 1. Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Improvement of motor function	1		Odds Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 Improvement of cognitive function	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2.1 Orientation	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.2 Perception	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.3 Praxis	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.4 Visuomotor organisation	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.5 Thinking operation	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.6 Memory	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.7 Attention	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3 Improvement of Health-Related Quality of Life (MOS SF-36)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3.1 Physical component summary	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.2 Mental component summary	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 Improvement of Stroke-Specific Quality of Life(SS QOL)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4.1 Language	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.2 Personality	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

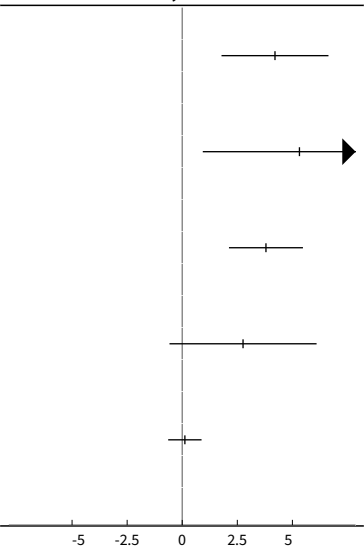
Analysis 1.1. Comparison 1 Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment, Outcome 1 Improvement of motor function.

Study or subgroup	Acupuncture n/N	Control n/N	Odds Ratio M-H, Fixed, 95% CI	Odds Ratio M-H, Fixed, 95% CI
Naeser 1992	4/10	0/6		9[0.4,203.3]

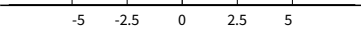


Analysis 1.2. Comparison 1 Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment, Outcome 2 Improvement of cognitive function.

Study or subgroup	Acupuncture N	Acupuncture Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Mean Difference Fixed, 95% CI
1.2.1 Orientation						
Chou 2009	17	4.7 (4.4)	16	0.4 (2.5)		4.21[1.78,6.64]
1.2.2 Perception						
Chou 2009	17	4.9 (6.9)	16	-0.4 (6)		5.32[0.93,9.71]
1.2.3 Praxis						
Chou 2009	17	3.1 (2.5)	16	-0.7 (2.4)		3.8[2.12,5.48]
1.2.4 Visuomotor organisation						
Chou 2009	17	1.8 (5.2)	16	-0.9 (4.6)		2.76[-0.58,6.1]
1.2.5 Thinking operation						
Chou 2009	17	0.1 (1.4)	16	-0.1 (0.8)		0.12[-0.64,0.88]
1.2.6 Memory						



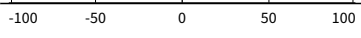
Study or subgroup	Acupuncture N	Acupuncture Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Mean Difference Fixed, 95% CI
Chou 2009	17	1.7 (3.2)	16	-0.4 (3.6)		2.14[-0.16,4.44]
1.2.7 Attention						
Chou 2009	17	0.3 (1.2)	16	-0.1 (1.1)		0.35[-0.43,1.13]



Favours control — Favours intervention

Analysis 1.3. Comparison 1 Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment, Outcome 3 Improvement of Health-Related Quality of Life (MOS SF-36).

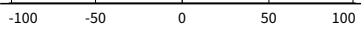
Study or subgroup	Acupuncture N	Acupuncture Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Mean Difference Fixed, 95% CI
1.3.1 Physical component summary						
Chou 2009	17	-2.2 (10.9)	16	0.4 (12.2)		-2.66[-10.57,5.25]
1.3.2 Mental component summary						
Chou 2009	17	10.7 (20.7)	16	-0.9 (18.2)		11.52[-1.76,24.8]



Favours control — Favours intervention

Analysis 1.4. Comparison 1 Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment, Outcome 4 Improvement of Stroke-Specific Quality of Life(SS QOL).

Study or subgroup	Acupuncture N	Acupuncture Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Mean Difference Fixed, 95% CI
1.4.1 Language						
Chou 2009	17	11.8 (25.7)	16	-1.6 (22.2)		13.34[-3.02,29.7]
1.4.2 Personality						
Chou 2009	17	2.4 (22.8)	16	-0.7 (20.7)		3.1[-11.73,17.93]



Favours control — Favours intervention

Comparison 2. Acupuncture plus baseline treatment versus baseline treatment alone

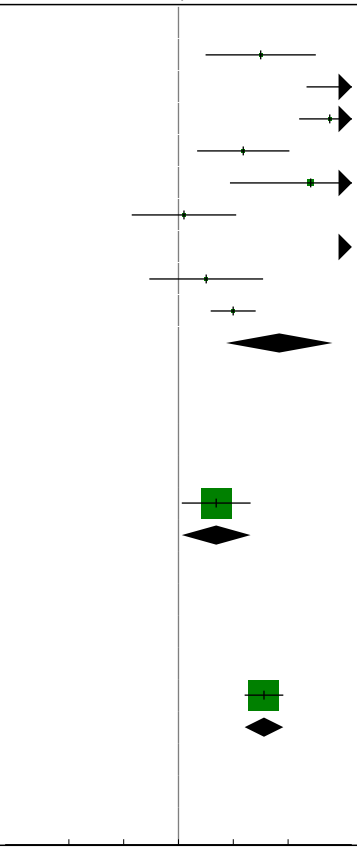
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Improvement of dependency at the end of treatment	11		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.1 Barthel Index	9	616	Mean Difference (IV, Random, 95% CI)	9.19 [4.34, 14.05]
1.2 Modified Barthel Index	1	60	Mean Difference (IV, Random, 95% CI)	3.44 [0.30, 6.58]
1.3 ADL	1	62	Mean Difference (IV, Random, 95% CI)	7.80 [6.04, 9.56]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
2 Improvement of dependency at the end of follow-up	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
2.1 Barthel index	1	147	Mean Difference (IV, Random, 95% CI)	7.49 [1.79, 13.19]
2.2 ADL	1	71	Mean Difference (IV, Random, 95% CI)	3.83 [2.67, 4.99]
3 Improvement of global neurological deficit at the end of treatment	6		Mean Difference (IV, Random, 95% CI)	Subtotals only
3.1 Modified Edinburgh and Scandinavian Stroke Scale	4	240	Mean Difference (IV, Random, 95% CI)	-2.39 [-3.34, -1.43]
3.2 Neurological function deficit scale	2	123	Mean Difference (IV, Random, 95% CI)	-1.02 [-5.80, 3.76]
4 Improvement of global neurological deficit at the end of follow-up	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
4.1 Neurological function deficit scale	1	71	Mean Difference (IV, Random, 95% CI)	-6.15 [-7.09, -5.21]
4.2 NIHSS	1	147	Mean Difference (IV, Random, 95% CI)	-0.83 [-1.94, 0.28]
5 Improvement of global neurological deficit at the end of treatment	7	543	Odds Ratio (M-H, Random, 95% CI)	3.89 [1.78, 8.49]
6 Improvement of motor function at the end of treatment	5		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
6.1 Upper and lower extremities motor function(Fugl-Meyer Assessment)	4	245	Mean Difference (IV, Fixed, 95% CI)	6.16 [4.20, 8.11]
6.2 General motor function (Motor assessment scale)	1	60	Mean Difference (IV, Fixed, 95% CI)	4.53 [2.99, 6.07]
7 Improvment of general motor function at the end of follow-up (Fugl-Meyer Assessment)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8 Improvement of motor function at the end of treatment (Fugl-Meyer Assessment)	2	125	Odds Ratio (M-H, Random, 95% CI)	2.41 [0.98, 5.96]
9 Improvement of cognitive function at the end of treatment	5		Mean Difference (IV, Random, 95% CI)	Subtotals only
9.1 MMSE	5	278	Mean Difference (IV, Random, 95% CI)	2.54 [0.03, 5.05]
9.2 MoCA	2	120	Mean Difference (IV, Random, 95% CI)	1.34 [0.76, 1.92]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
9.3 HDS-R	1	46	Mean Difference (IV, Random, 95% CI)	1.26 [0.29, 2.23]
10 Improvment of cognitive function at the end of follow-up (MMSE)	1	71	Mean Difference (IV, Fixed, 95% CI)	3.47 [2.43, 4.51]
11 Improvement of cognitive function at the end of treatment	3		Odds Ratio (M-H, Random, 95% CI)	Subtotals only
11.1 MMSE	3	166	Odds Ratio (M-H, Random, 95% CI)	3.82 [1.89, 7.72]
11.2 HDS-R	1	46	Odds Ratio (M-H, Random, 95% CI)	4.02 [1.12, 14.46]
12 Improvement of depression at the end of treatment	6		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
12.1 HAMD	6	552	Mean Difference (IV, Fixed, 95% CI)	-2.58 [-3.28, -1.87]
12.2 Symptoms of TCM depression scale	1	60	Mean Difference (IV, Fixed, 95% CI)	-1.57 [-2.96, -0.18]
13 Improvement of depression at the end of treatment (HAMD)	4	342	Odds Ratio (M-H, Random, 95% CI)	2.03 [1.10, 3.72]
14 Improvement of swallowing function at the end of treatment (Water drinking test)	2	200	Mean Difference (IV, Random, 95% CI)	-1.11 [-2.08, -0.14]
15 Improvement of swallowing function at the end of treatment (Water drinking test)	1	60	Odds Ratio (M-H, Random, 95% CI)	95.29 [10.93, 830.86]
16 Improvement of pain at the end of treatment (Visual Analogue Scale)	2	118	Mean Difference (IV, Fixed, 95% CI)	-2.88 [-3.68, -2.09]
17 Improvement of sleep quality at the end of treatment (Rhone Planck Sleepiness Scale)	1	60	Mean Difference (IV, Fixed, 95% CI)	-1.09 [-2.37, 0.19]
18 Improvement of spasticity at the end of treatment (Modified Ashworth Spasticity Rating Scale)	1	60	Mean Difference (IV, Fixed, 95% CI)	-0.4 [-0.64, -0.16]
19 Improvement of quality of life at the end of treatment (MOS SF-36)	1	71	Mean Difference (IV, Fixed, 95% CI)	2.73 [-0.54, 6.00]

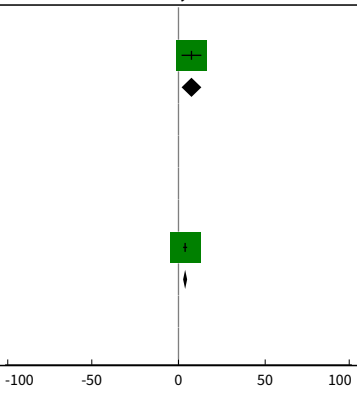
Analysis 2.1. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 1 Improvement of dependency at the end of treatment.

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
2.1.1 Barthel Index							
Bao 2012	30	20.6 (10.3)	30	13.1 (9.6)		10.82%	7.5[2.47,12.53]
Huang 2008a	30	38.9 (8.8)	30	22.4 (10)		10.95%	16.45[11.68,21.22]
Ke 2015	40	28.9 (6.8)	40	15.1 (5.9)		11.76%	13.8[11.01,16.59]
Li 2010a	24	10 (9)	22	4.1 (5.3)		11.21%	5.91[1.7,10.12]
Wu 2011a	30	15.1 (15.5)	30	3 (13.6)		9.55%	12.06[4.7,19.42]
Yao 2014	30	4 (9.8)	30	3.5 (9)		10.95%	0.5[-4.26,5.26]
Zhan 2014	65	67 (5.1)	65	48.6 (4.8)		12.06%	18.42[16.73,20.11]
Zhang 2015	30	25 (10.5)	30	22.4 (10)		10.74%	2.53[-2.66,7.72]
Zheng 2014	30	10.8 (4.2)	30	5.8 (3.9)		11.97%	4.99[2.94,7.04]
Subtotal ***	**309**		**307**			**100%**	**9.19[4.34,14.05]**
Heterogeneity: Tau²=50.22; Chi²=150.72, df=8(P<0.0001); I²=94.69%							
Test for overall effect: Z=3.71(P=0)							
2.1.2 Modified Barthel Index							
Wang 2012	30	14.7 (6.2)	30	11.2 (6.2)		100%	3.44[0.3,6.58]
Subtotal ***	**30**		**30**			**100%**	**3.44[0.3,6.58]**
Heterogeneity: Not applicable							
Test for overall effect: Z=2.15(P=0.03)							
2.1.3 ADL							
Li 2011a	31	12.7 (3.4)	31	4.9 (3.7)		100%	7.8[6.04,9.56]
Subtotal ***	**31**		**31**			**100%**	**7.8[6.04,9.56]**
Heterogeneity: Not applicable							
Test for overall effect: Z=8.67(P<0.0001)							
Test for subgroup differences: Chi²=6.52, df=1 (P=0.04), I²=69.32%							



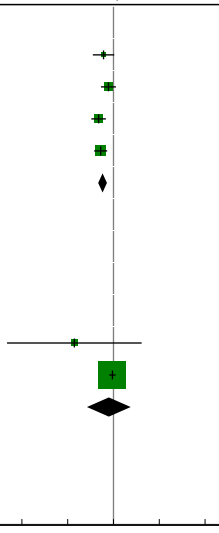
Analysis 2.2. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 2 Improvement of dependency at the end of follow-up.

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
2.2.1 Barthel index							
Zhou 2014	75	35.3 (16.4)	72	27.8 (18.7)		100%	7.49[1.79,13.19]
Subtotal ***	**75**		**72**			**100%**	**7.49[1.79,13.19]**
Heterogeneity: Not applicable							
Test for overall effect: Z=2.57(P=0.01)							
2.2.2 ADL							
Sun 2013a	36	10.2 (1.7)	35	6.3 (3.1)		100%	3.83[2.67,4.99]
Subtotal ***	**36**		**35**			**100%**	**3.83[2.67,4.99]**
Heterogeneity: Not applicable							
Test for overall effect: Z=6.47(P<0.0001)							



Analysis 2.3. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 3 Improvement of global neurological deficit at the end of treatment.

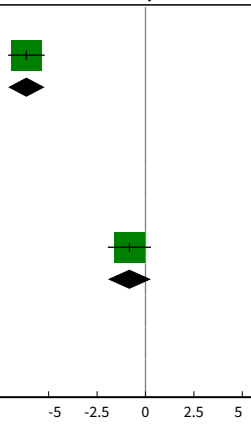
Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
2.3.1 Modified Edinburgh and Scandinavian Stroke Scale							
Gao 2014a	30	-10 (4.6)	30	-7.8 (4.7)		14.57%	-2.17[-4.5,0.16]
Zhang 2015	30	-4.8 (3.5)	30	-3.7 (2.9)		26.17%	-1.1[-2.73,0.53]
Zhu 2007	30	-7.8 (2.6)	30	-4.5 (3.6)		27.19%	-3.25[-4.84,-1.66]
Huang 2008a	30	-6.5 (2.7)	30	-3.7 (2.9)		32.07%	-2.8[-4.22,-1.38]
Subtotal ***	**120**		**120**			**100%**	**-2.39[-3.34,-1.43]**
Heterogeneity: Tau^2=0.22; Chi^2=3.88, df=3(P=0.27); I^2=22.63%							
Test for overall effect: Z=4.89(P<0.0001)							
2.3.2 Neurological function deficit scale							
Guo 2011	32	-14.9 (42)	31	-6.3 (5.8)		9.48%	-8.55[-23.25,6.15]
Yao 2014	30	-1.4 (1.4)	30	-1.2 (1.3)		90.52%	-0.23[-0.92,0.46]
Subtotal ***	**62**		**61**			**100%**	**-1.02[-5.8,3.76]**
Heterogeneity: Tau^2=6.44; Chi^2=1.23, df=1(P=0.27); I^2=18.61%							
Test for overall effect: Z=0.42(P=0.68)							
Test for subgroup differences: Chi^2=0.3, df=1 (P=0.58), I^2=0%							



Favours intervention — Favours control

Analysis 2.4. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 4 Improvement of global neurological deficit at the end of follow-up.

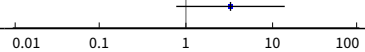
Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
2.4.1 Neurological function deficit scale							
Sun 2013a	36	-10.1 (1.7)	35	-4 (2.3)		100%	-6.15[-7.09,-5.21]
Subtotal ***	**36**		**35**			**100%**	**-6.15[-7.09,-5.21]**
Heterogeneity: Not applicable							
Test for overall effect: Z=12.8(P<0.0001)							
2.4.2 NIHSS							
Zhou 2014	75	-5.4 (2.5)	72	-4.6 (4.1)		100%	-0.83[-1.94,0.28]
Subtotal ***	**75**		**72**			**100%**	**-0.83[-1.94,0.28]**
Heterogeneity: Not applicable							
Test for overall effect: Z=1.46(P=0.14)							
Test for subgroup differences: Chi^2=51.22, df=1 (P<0.0001), I^2=98.05%							



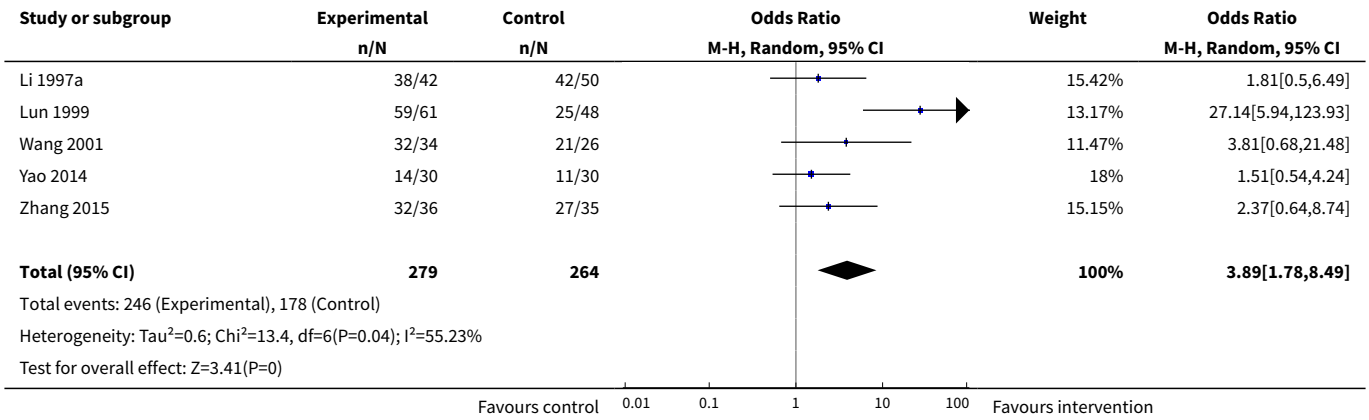
Favours intervention — Favours control

Analysis 2.5. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 5 Improvement of global neurological deficit at the end of treatment.

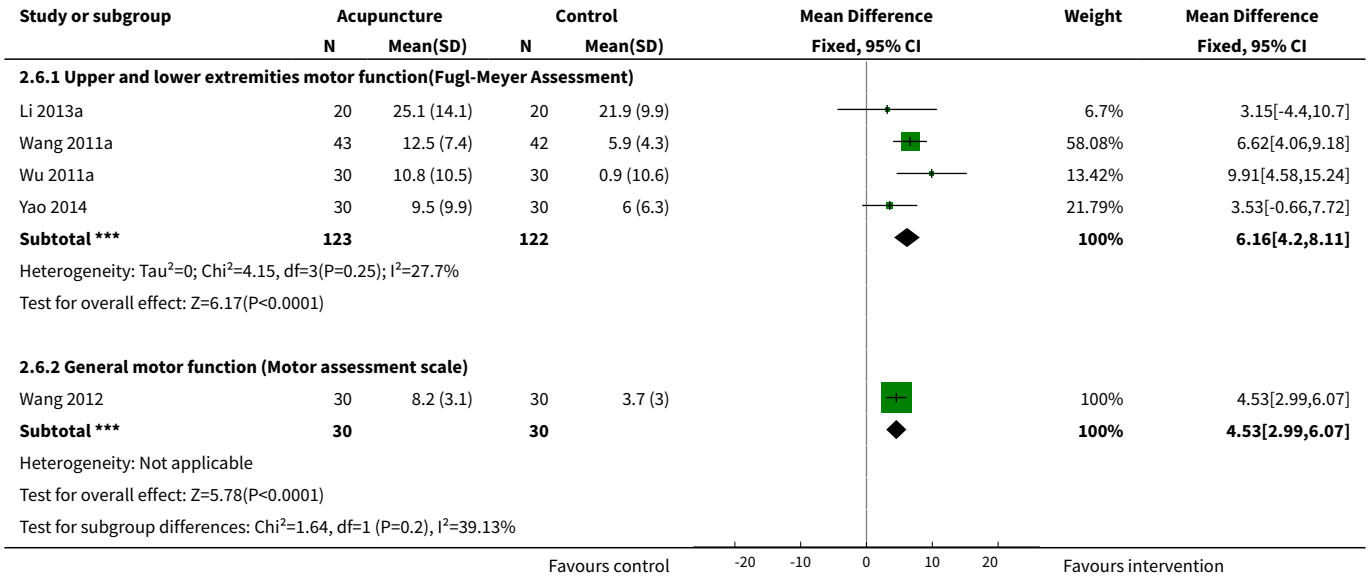
Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Dai 1997	44/46	30/45		12.93%	11[2.34,51.65]
Huang 2008a	27/30	22/30		13.86%	3.27[0.77,13.83]



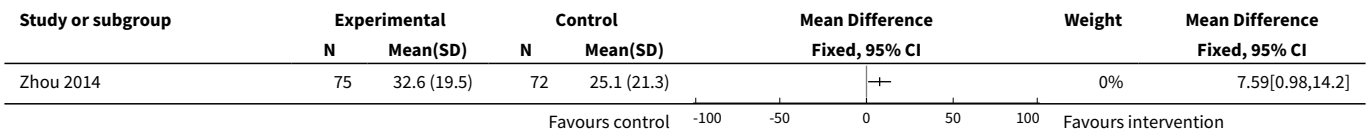
Favours control — Favours intervention



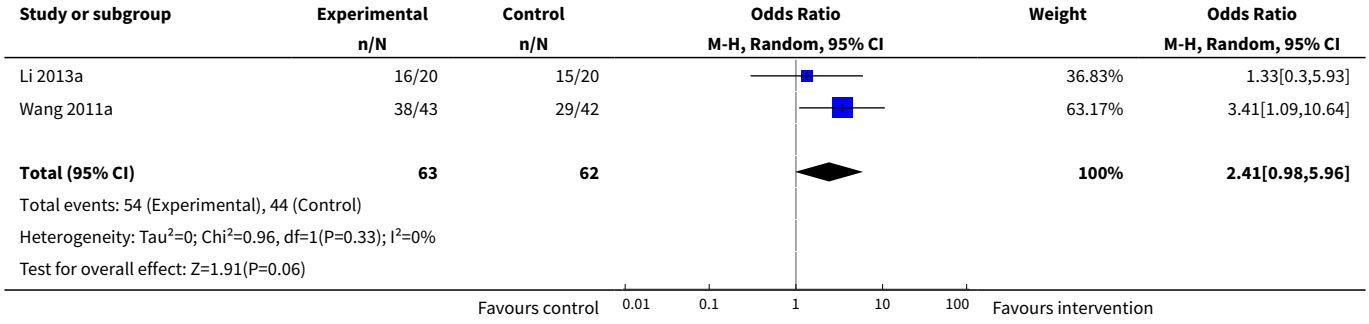
Analysis 2.6. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 6 Improvement of motor function at the end of treatment.



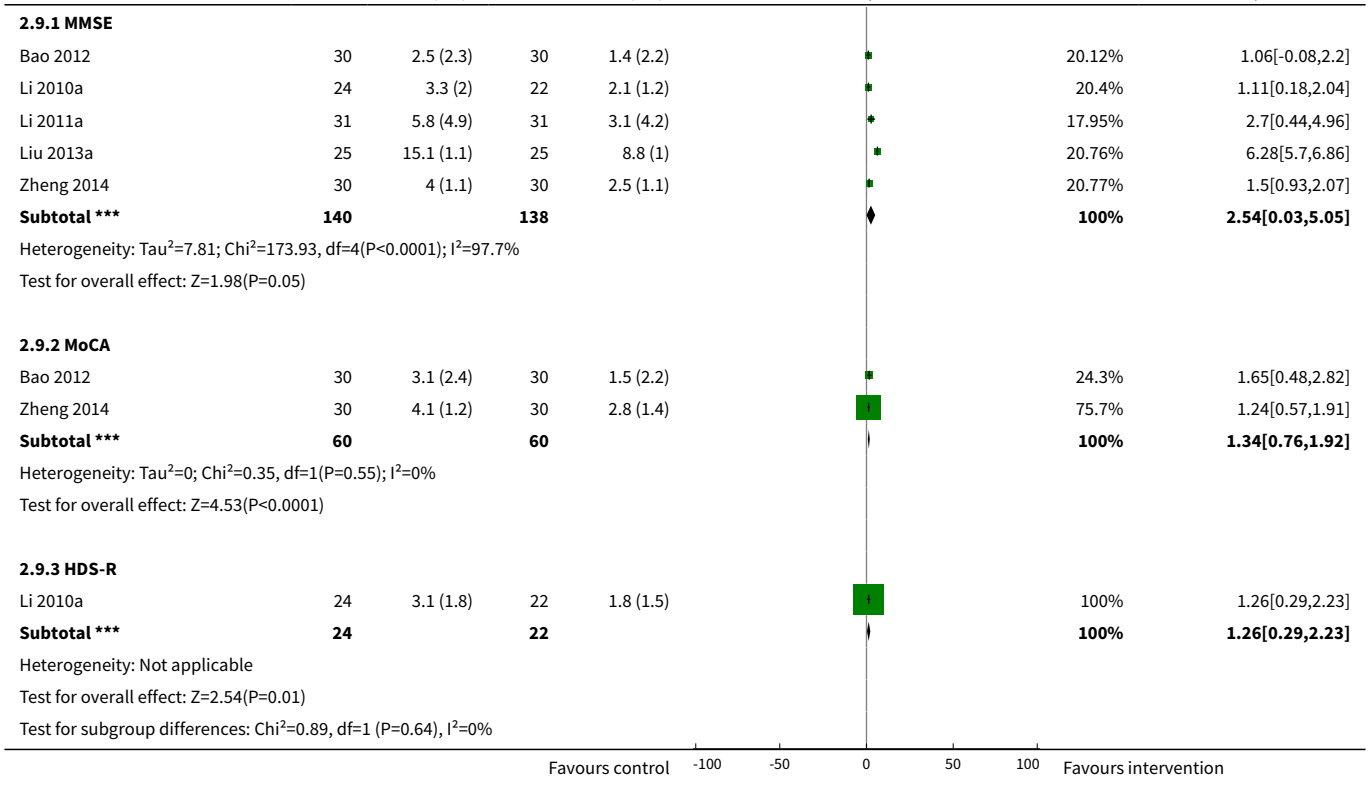
Analysis 2.7. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 7 Improvment of general motor function at the end of follow-up (Fugl-Meyer Assessment).



Analysis 2.8. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 8 Improvement of motor function at the end of treatment (Fugl-Meyer Assessment).



Analysis 2.9. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 9 Improvement of cognitive function at the end of treatment.



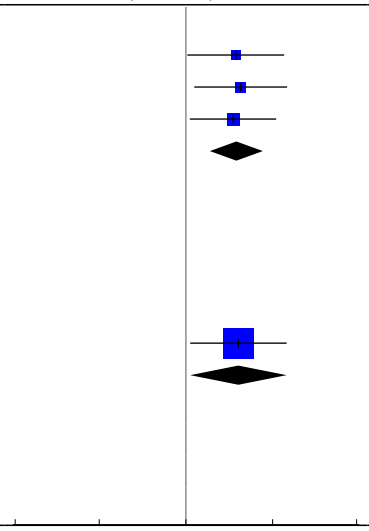
Analysis 2.10. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 10 Improvment of cognitive function at the end of follow-up (MMSE).

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Sun 2013a	36	14.8 (2.4)	35	11.4 (2.1)		100%	3.47[2.43,4.51]
Total ***	**36**		**35**			**100%**	**3.47[2.43,4.51]**
Heterogeneity: Not applicable							
Test for overall effect: Z=6.51(P<0.0001)							

Favours control — Favours intervention

Analysis 2.11. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 11 Improvement of cognitive function at the end of treatment.

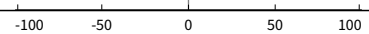
Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
2.11.1 MMSE					
Bao 2012	26/30	19/30		29.85%	3.76[1.04,13.65]
Li 2010a	16/24	7/22		32.48%	4.29[1.25,14.74]
Zheng 2014	24/30	16/30		37.67%	3.5[1.11,11.02]
Subtotal (95% CI)	**84**	**82**		**100%**	**3.82[1.89,7.72]**
Total events: 66 (Experimental), 42 (Control)					
Heterogeneity: Tau^2=0; Chi^2=0.06, df=2(P=0.97); I^2=0%					
Test for overall effect: Z=3.73(P=0)					
2.11.2 HDS-R					
Li 2010a	13/24	5/22		100%	4.02[1.12,14.46]
Subtotal (95% CI)	**24**	**22**		**100%**	**4.02[1.12,14.46]**
Total events: 13 (Experimental), 5 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=2.13(P=0.03)					
Test for subgroup differences: Chi^2=0, df=1 (P=0.95), I^2=0%					



Favours control — Favours intervention

Analysis 2.12. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 12 Improvement of depression at the end of treatment.

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
2.12.1 HAMD							
Gao 2014a	30	-13.3 (6.3)	30	-9.6 (6.8)		4.53%	-3.66[-6.98,-0.34]
Guo 2011	32	-12.7 (5.7)	31	-8.5 (5.2)		6.98%	-4.19[-6.87,-1.51]
Sun 2015	31	-17.1 (5.8)	31	-13 (5.5)		6.33%	-4.08[-6.89,-1.27]
Wu 2008	40	-10 (4.6)	40	-6 (4)		14.09%	-4[-5.88,-2.12]
Wu 2008	40	-19 (5)	40	-14 (4)		12.71%	-5[-6.98,-3.02]
Zhang 2013a	30	-10.2 (2.2)	30	-8.5 (2.5)		35.41%	-1.7[-2.89,-0.51]
Zhou 2014	75	-6.8 (4.9)	72	-6.5 (4.9)		19.96%	-0.3[-1.88,1.28]
Subtotal ***	**278**		**274**			**100%**	**-2.58[-3.28,-1.87]**

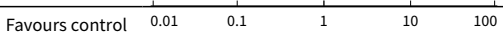


Favours intervention — Favours control

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Heterogeneity: Tau²=0; Chi²=20.85, df=6(P=0); I²=71.23%							
Test for overall effect: Z=7.14(P<0.0001)							
2.12.2 Symptoms of TCM depression scale							
Gao 2014a	30	5.7 (2.6)	30	7.3 (2.9)		100%	-1.57[-2.96,-0.18]
Subtotal ***	**30**		**30**			**100%**	**-1.57[-2.96,-0.18]**
Heterogeneity: Not applicable							
Test for overall effect: Z=2.21(P=0.03)							
Test for subgroup differences: Chi²=1.6, df=1 (P=0.21), I²=37.59%							

Analysis 2.13. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 13 Improvement of depression at the end of treatment (HAMD).

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Gao 2014a	26/30	22/30		20.93%	2.36[0.63,8.92]
Sun 2015	30/31	25/31		7.75%	7.2[0.81,63.85]
Wu 2008	33/40	28/40		32.87%	2.02[0.7,5.83]
Wu 2008	36/40	34/40		20.27%	1.59[0.41,6.12]
Zhang 2013a	26/30	25/30		18.18%	1.3[0.31,5.4]
Total (95% CI)	**171**	**171**		**100%**	**2.03[1.1,3.72]**
Total events: 151 (Experimental), 134 (Control)					
Heterogeneity: Tau²=0; Chi²=1.86, df=4(P=0.76); I²=0%					
Test for overall effect: Z=2.28(P=0.02)					

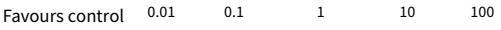


Analysis 2.14. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 14 Improvement of swallowing function at the end of treatment (Water drinking test).

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
Wu 2013a	30	-2.2 (0.7)	30	-1.6 (0.7)		48.61%	-0.6[-0.96,-0.24]
Xu 2013	70	-3 (0.4)	70	-1.5 (0.6)		51.39%	-1.59[-1.75,-1.43]
Total ***	**100**		**100**			**100%**	**-1.11[-2.08,-0.14]**
Heterogeneity: Tau²=0.47; Chi²=23.99, df=1(P<0.0001); I²=95.83%							
Test for overall effect: Z=2.24(P=0.03)							

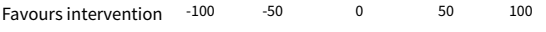
Analysis 2.15. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 15 Improvement of swallowing function at the end of treatment (Water drinking test).

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Guo 2012	29/30	7/30		100%	95.29[10.93,830.86]
Total (95% CI)	**30**	**30**		**100%**	**95.29[10.93,830.86]**
Total events: 29 (Experimental), 7 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=4.12(P<0.0001)					



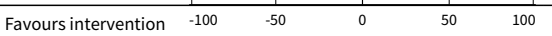
Analysis 2.16. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 16 Improvement of pain at the end of treatment (Visual Analogue Scale).

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Wang 2011a	43	-4.7 (2.4)	42	-1.8 (2.2)		64.94%	-2.87[-3.85,-1.89]
Yao 2014	16	-3.4 (1.9)	17	-0.5 (2.1)		35.06%	-2.91[-4.25,-1.57]
Total ***	**59**		**59**			**100%**	**-2.88[-3.68,-2.09]**
Heterogeneity: Tau^2=0; Chi^2=0, df=1(P=0.96); I^2=0%							
Test for overall effect: Z=7.14(P<0.0001)							



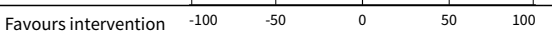
Analysis 2.17. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 17 Improvement of sleep quality at the end of treatment (Rhone Planck Sleepiness Scale).

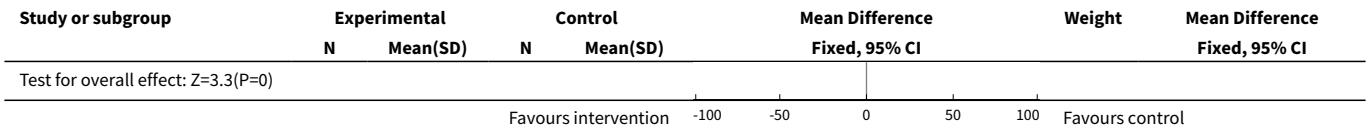
Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Zhang 2013a	30	-6.6 (2.3)	30	-5.5 (2.7)		100%	-1.09[-2.37,0.19]
Total ***	**30**		**30**			**100%**	**-1.09[-2.37,0.19]**
Heterogeneity: Not applicable							
Test for overall effect: Z=1.66(P=0.1)							



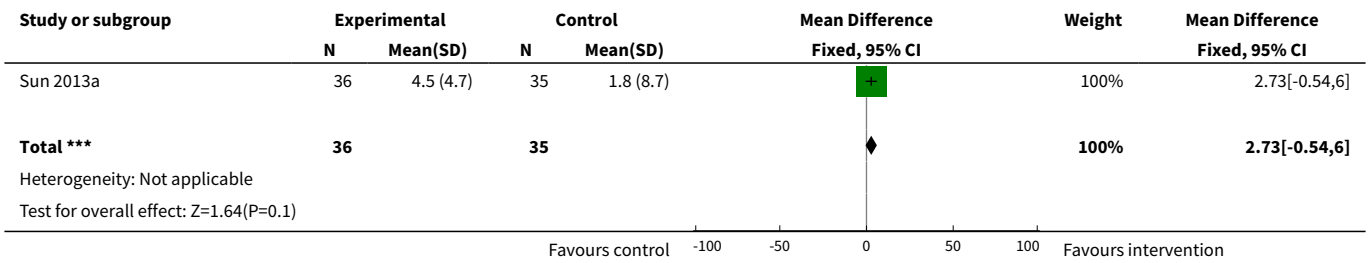
Analysis 2.18. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 18 Improvement of spasticity at the end of treatment (Modified Ashworth Spasticity Rating Scale).

Study or subgroup	Experimental N	Experimental Mean(SD)	Control N	Control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Wu 2011a	30	-0.5 (0.5)	30	-0.1 (0.5)		100%	-0.4[-0.64,-0.16]
Total ***	**30**		**30**			**100%**	**-0.4[-0.64,-0.16]**
Heterogeneity: Not applicable							





Analysis 2.19. Comparison 2 Acupuncture plus baseline treatment versus baseline treatment alone, Outcome 19 Improvement of quality of life at the end of treatment (MOS SF-36).



APPENDICES

Appendix 1. Cochrane Stroke Group Trials Register search strategy

Stage: Late treatment (> 30 days)

Disease: Not specified

Condition: Not specified

Intervention type: Complementary medical therapy

Intervention code: Acupuncture

Appendix 2. CENTRAL search strategy

The Cochrane Library, June 2015

#1 [mh ^"cerebrovascular disorders"] or [mh "basal ganglia cerebrovascular disease"] or [mh "brain ischemia"] or [mh "carotid artery diseases"] or [mh "cerebral small vessel diseases"] or [mh "intracranial arterial diseases"] or [mh "intracranial embolism and thrombosis"] or [mh "intracranial hemorrhages"] or [mh ^stroke] or [mh "brain infarction"] or [mh ^"stroke, lacunar"] or [mh ^"vasospasm, intracranial"] or [mh ^"vertebral artery dissection"]

#2 (stroke or poststroke or "post-stroke" or cerebrovasc* or brain next vasc* or cerebral next vasc* or cva* or apoplex* or SAH):ti,ab

#3 ((brain* or cerebr* or cerebell* or intracran* or intracerebral) near/5 (isch*emi* or infarct* or thrombo* or emboli* or occlus*)):ti,ab

#4 ((brain* or cerebr* or cerebell* or intracerebral or intracranial or subarachnoid) near/5 (haemorrhage* or hemorrhage* or haematoma* or hematoma* or bleed*)):ti,ab

#5 [mh ^hemiplegia] or [mh ^paresis]

#6 (hemipleg* or hemipar* or paresis or paretic):ti,ab

#7 [mh ^"brain injuries"] or [mh ^"brain injury, chronic"]

#8 #1 or #2 or #3 or #4 or #5 or #6 or #7

#9 [mh ^acupuncture] or [mh ^"acupuncture therapy"] or [mh ^"acupuncture analgesia"] or [mh ^"acupuncture, ear"] or [mh ^electroacupuncture] or [mh ^meridians] or [mh ^"acupuncture points"] or [mh ^"trigger points"]

#10 (acupuncture* or electroacupuncture or "electro-acupuncture" or acupoint* or meridians or needling):ti,ab

#11 ((meridian or non-meridian or trigger) near/10 point*):ti,ab

#12 #9 or #10 or #11

#13 #8 and #12

Appendix 3. MEDLINE search strategy

MEDLINE (Ovid) November 2005 to July 2015

1. cerebrovascular disorders/ or exp basal ganglia cerebrovascular disease/ or exp brain ischemia/ or exp carotid artery diseases/ or exp cerebral small vessel diseases/ or exp intracranial arterial diseases/ or exp "intracranial embolism and thrombosis"/ or exp intracranial hemorrhages/ or stroke/ or exp brain infarction/ or stroke, lacunar/ or vasospasm, intracranial/ or vertebral artery dissection/

2. (stroke or poststroke or post-stroke or cerebrovasc$ or brain vasc$ or cerebral vasc$ or cva$ or apoplex$ or SAH).tw.

3. ((brain$ or cerebr$ or cerebell$ or intracran$ or intracerebral) adj5 (isch?emi$ or infarct$ or thrombo$ or emboli$ or occlus$)).tw.

4. ((brain$ or cerebr$ or cerebell$ or intracerebral or intracranial or subarachnoid) adj5 (haemorrhage$ or hemorrhage$ or haematoma$ or hematoma$ or bleed$)).tw.

5. hemiplegia/ or exp paresis/

6. (hemipleg$ or hemipar$ or paresis or paretic).tw.

7. brain injuries/ or brain injury, chronic/

8. or/1-7

9. acupuncture/ or acupuncture therapy/ or acupuncture analgesia/ or acupuncture, ear/ or electroacupuncture/ or meridians/ or acupuncture points/ or trigger points/

10. (acupuncture$ or electroacupuncture or electro-acupuncture or acupoint$ or meridians or needling).tw.

11. ((meridian or non-meridian or trigger) adj10 point$).tw.

12. 9 or 10 or 11

13. 8 and 12

14. Randomized Controlled Trials as Topic/

15. random allocation/

16. Controlled Clinical Trials as Topic/

17. control groups/

18. clinical trials as topic/ or clinical trials, phase i as topic/ or clinical trials, phase ii as topic/ or clinical trials, phase iii as topic/ or clinical trials, phase iv as topic/

19. double-blind method/

20. single-blind method/

21. Placebos/

22. placebo effect/

23. cross-over studies/

24. randomized controlled trial.pt.

25. controlled clinical trial.pt.

26. (clinical trial or clinical trial phase i or clinical trial phase ii or clinical trial phase iii or clinical trial phase iv).pt.

27. (random$ or RCT or RCTs).tw.

28. (controlled adj5 (trial$ or stud$)).tw.

29. (clinical$ adj5 trial$).tw.

30. ((control or treatment or experiment$ or intervention) adj5 (group$ or subject$ or patient$)).tw.

31. (quasi-random$ or quasi random$ or pseudo-random$ or pseudo random$).tw.

32. ((control or experiment$ or conservative) adj5 (treatment or therapy or procedure or manage$)).tw.

33. ((singl$ or doubl$ or tripl$ or trebl$) adj5 (blind$ or mask$)).tw.

34. (cross-over or cross over or crossover).tw.

35. (placebo$ or sham).tw.

36. trial.ti.

37. (assign$ or allocat$).tw.

38. controls.tw.

39. or/14-38

40. 13 and 39

41. exp animals/ not humans/

42. 40 not 41

Appendix 4. EMBASE search strategy

EMBASE (Ovid) November 2005 to July 2015

1. cerebrovascular disease/ or exp basal ganglion hemorrhage/ or exp brain hematoma/ or exp brain hemorrhage/ or exp brain infarction/ or exp brain ischemia/ or exp carotid artery disease/ or cerebral artery disease/ or exp cerebrovascular accident/ or exp intracranial aneurysm/ or exp occlusive cerebrovascular disease/ or stroke unit/ or stroke patient/

2. (stroke or poststroke or post-stroke or cerebrovasc$ or brain vasc$ or cerebral vasc$ or cva$ or apoplex$ or SAH).tw.

3. ((brain$ or cerebr$ or cerebell$ or intracran$ or intracerebral) adj5 (isch?emi$ or infarct$ or thrombo$ or emboli$ or occlus$)).tw.

4. ((brain$ or cerebr$ or cerebell$ or intracerebral or intracranial or subarachnoid) adj5 (haemorrhage$ or hemorrhage$ or haematoma$ or hematoma$ or bleed$)).tw.

5. hemiparesis/ or hemiplegia/ or paresis/

6. (hemipleg$ or hemipar$ or paresis or paretic).tw.

7. brain injury/ or acquired brain injury/

8. or/1-7

9. acupuncture/ or acupuncture analgesia/ or electroacupuncture/ or acupuncture needle/

10. (acupuncture$ or electroacupuncture or electro-acupuncture or acupoint$ or meridians or needling).tw.

11. ((meridian or non-meridian or trigger) adj10 point$).tw.

12. 9 or 10 or 11

13. 8 and 12

14. Randomized Controlled Trial/ or "randomized controlled trial (topic)"/

15. Randomization/

16. Controlled clinical trial/ or "controlled clinical trial (topic)"/

17. control group/ or controlled study/

18. clinical trial/ or "clinical trial (topic)"/ or phase 1 clinical trial/ or phase 2 clinical trial/ or phase 3 clinical trial/ or phase 4 clinical trial/

19. Crossover Procedure/

20. Double Blind Procedure/

21. Single Blind Procedure/ or triple blind procedure/

22. placebo/ or placebo effect/

23. (random$ or RCT or RCTs).tw.

24. (controlled adj5 (trial$ or stud$)).tw.

25. (clinical$ adj5 trial$).tw.

26. ((control or treatment or experiment$ or intervention) adj5 (group$ or subject$ or patient$)).tw.

27. (quasi-random$ or quasi random$ or pseudo-random$ or pseudo random$).tw.

28. ((control or experiment$ or conservative) adj5 (treatment or therapy or procedure or manage$)).tw.

29. ((singl$ or doubl$ or tripl$ or trebl$) adj5 (blind$ or mask$)).tw.

30. (cross-over or cross over or crossover).tw.

31. (placebo$ or sham).tw.

32. trial.ti.

33. (assign$ or allocat$).tw.

34. controls.tw.

35. or/14-34

36. 13 and 35

37. (exp animals/ or exp invertebrate/ or animal experiment/ or animal model/ or animal tissue/ or animal cell/ or nonhuman/) not (human/ or normal human/ or human cell/)

38. 36 not 37

Appendix 5. CINAHL search strategy

CINAHL (EBSCO) November 2005 to July 2015

S1 -(MH "Cerebrovascular Disorders") OR (MH "Basal Ganglia Cerebrovascular Disease+") OR (MH "Carotid Artery Diseases+") OR (MH "Cerebral Ischemia+") OR (MH "Cerebral Vasospasm") OR (MH "Intracranial Arterial Diseases+") OR (MH "Intracranial Embolism and Thrombosis") OR (MH "Intracranial Hemorrhage+") OR (MH "Stroke") OR (MH "Vertebral Artery Dissections")

S2 -(MH "Stroke Patients") OR (MH "Stroke Units")

S3 -TI (stroke* or poststroke or apoplex* or cerebral vasc* or brain vasc* or cerebrovasc* or cva* or SAH) or AB (stroke* or poststroke or apoplex* or cerebral vasc* or brain vasc* or cerebrovasc* or cva* or SAH)

S4 -TI (brain or cerebr* or cerebell* or intracran* or intracerebral) or AB (brain or cerebr* or cerebell* or intracran* or intracerebral)

S5 -TI (ischemi* or ischaemi* or infarct* or thrombo* or emboli* or occlus*) or AB (ischemi* or ischaemi* or infarct* or thrombo* or emboli* or occlus*)

S6 -S4 and S5

S7 -TI (brain* or cerebr* or cerebell* or intracerebral or intracran* or subarachnoid) or AB (brain* or cerebr* or cerebell* or intracerebral or intracran* or subarachnoid)

S8 -TI (haemorrhage* or hemorrhage* or haematoma* or hematoma* or bleed*) or AB (haemorrhage* or hemorrhage* or haematoma* or hematoma* or bleed*)

S9 -S7 and S8

S10 -(MH "Hemiplegia")

S11 -TI (hemipleg* or hemipar* or paresis or paretic) or AB (hemipleg* or hemipar* or paresis or paretic)

S12 -(MH "Brain Injuries")

S13 -S1 OR S2 OR S3 OR S6 OR S9 OR S10 OR S11 OR S12

S14 -(MH "Acupuncture") OR (MH "Acupuncture Analgesia") OR (MH "Acupuncture Anesthesia") OR (MH "Acupuncture, Ear") OR (MH "Electroacupuncture") OR (MH "Meridians") OR (MH "Acupuncture Points") OR (MH "Acupuncturists") OR (MH "Trigger Point")

S15 -TI (acupuncture* or electroacupuncture or electro-acupuncture or acupoint* or meridians or needling) OR AB (acupuncture* or electroacupuncture or electro-acupuncture or acupoint* or meridians or needling)

S16 -TI ((meridian or non-meridian or trigger) N10 point*) or AB ((meridian or non-meridian or trigger) N10 point*)

S17 -S14 OR S15 OR S16

S18 -S13 AND S17

Appendix 6. AMED search strategy

AMED (Ovid) November 2005 to July 2015

1. cerebrovascular disorders/ or cerebral hemorrhage/ or cerebral infarction/ or cerebral ischemia/ or cerebrovascular accident/ or stroke/

2. (stroke or poststroke or post-stroke or cerebrovasc$ or brain vasc$ or cerebral vasc$ or cva$ or apoplex$ or SAH).tw.

3. ((brain$ or cerebr$ or cerebell$ or intracran$ or intracerebral) adj5 (isch?emi$ or infarct$ or thrombo$ or emboli$ or occlus$)).tw.

4. ((brain$ or cerebr$ or cerebell$ or intracerebral or intracranial or subarachnoid) adj5 (haemorrhage$ or hemorrhage$ or haematoma$ or hematoma$ or bleed$)).tw.

5. hemiplegia/

6. (hemipleg$ or hemipar$ or paresis or paretic).tw.

7. brain injuries/

8. or/1-7

9. acupuncture/ or acupuncture therapy/ or acupoints/ or neiguan/ or acupuncture analgesia/ or ear acupuncture/ or electroacupuncture/ or meridians/ or needling/ or scalp acupuncture/

10. (acupuncture$ or electroacupuncture or electro-acupuncture or acupoint$ or meridians or needling).tw.

11. ((meridian or non-meridian or trigger) adj10 point$).tw.

12. 9 or 10 or 11

13. 8 and 12

Appendix 7. CBM search strategy

#1 中风

#2 卒中

#3 脑血管

#4 脑*塞

#5 脑*血

#6 脑*栓

#7 蛛网膜下腔出血

#8 主题词="中风/全部副主题/全部树"

#9 主题词="脑血管意外/全部副主题/全部树"

#10 主题词="垂体卒中/全部副主题"

#11 主题词="梗塞, 大脑中动脉/全部副主题"

#12 主题词="梗塞, 大脑前动脉/全部副主题"

#13 主题词="梗塞, 大脑后动脉/全部副主题"

#14 主题词= "中风后遗症/全部副主题"

#15 主题词= "中风先兆症/全部副主题"

#16 主题词=="蛛网膜下腔出血/全部副主题/全部树"

#17 #1 or #2 or #3 or #4 or #5 or #6 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15

#18 随机

#19 盲法

#20 单盲

#21 双盲

#22 三盲

#23 安慰剂

#24 主题词="随机对照试验 [文献类型]"

#25 主题词="随机分配"

#26 主题词="随机对照试验/全部副主题"

#27 #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26

#28 针

#29 电针

#30 长针

#31 芒针

#32 皮下针

#33 火针

#34 头针

#35 手捻针

#36 巨针

#37 头皮针

#38 体针

#39 温针

#40 透刺

#41 巨刺

#42 针法

#43 刺法

#44 眼针

#45 磁极针

#46 毫针

#47 谬刺

#48 皮内针

#49 鑱针

#50 园针

#51 鍉针

#52 锋针

#53 铍针

#54 圆利针

#55 大针

#56 #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 #52 or #53 or #54 or #55

Appendix 8. CNKI search strategy

(主题=中风 OR 主题=卒中 OR 主题=脑血管 OR 主题=脑梗塞 OR 主题=脑梗死 OR 主题=脑血栓 OR 主题=脑栓塞 OR 主题=脑出血 OR 主题=脑溢血 OR 主题=蛛网膜下腔出血) AND (主题=随机 OR 主题=盲法 OR 主题=单盲 OR 主题=双盲 OR 主题=三盲 OR 主题=安慰剂) AND (主题=针灸 OR 主题=针刺 OR 主题=电针 OR 主题=芒针 OR 主题=皮下针 OR 主题=火针 OR 主题=头针 OR 主题=手捻针 OR 主题=针刀 OR 主题=长针 OR 主题=巨针 OR 主题=头皮针 OR 主题=体针 OR 主题=温针 OR 主题=透刺 OR 主题=巨刺 OR 主题=针法 OR 主题=刺法 OR 主题=眼针 OR 主题=磁极针 OR 主题=毫针 OR 主题=谬刺 OR 主题=皮内针 OR 主题=鑱针 OR 主题=园针 OR 主题=鍉针 OR 主题=锋针 OR 主题=铍针 OR 主题=圆利针 OR 主题=大针)

Appendix 9. VIP search strategy

(U=中风+U=卒中+U=脑血管+U=脑梗塞+U=脑梗死+U=脑血栓+U=脑栓塞+U=脑出血+U=脑溢血+U=蛛网膜下腔出血)*(U=随机+U=盲法+U=安慰剂)*(U=针灸+U=针刺+U=电针+U=针法+U=刺法+U=磁极针)*全部期刊*年=2005-2015

Appendix 10. Wanfang search strategy

((中风 or 卒中 or 脑血管* or 脑梗* or 脑*栓 or 脑栓* or 脑*血 or 蛛网膜下腔出血) and (((((("随机") or ("盲法")) or ("单盲")) or ("双盲")) or ("安慰剂")))) and (((((("针灸") or ("针法")) or ("针刺")) or ("电针")) and ("刺法"))

Appendix 11. Risk of bias assessment tool

Potential source of bias	Assessment criteria
Random sequence generation Selection bias (biased allocation to interventions) due to inadequate generation of a randomised sequence	*Low risk of bias:* Random number table; computer random number generator; coin tossing; shuffling cards or envelopes; throwing dice; drawing of lots; minimization (minimization may be implemented without a random element, and this is considered to be equivalent to being random).
	High risk of bias: Sequence generated by odd or even date of birth; date (or day) of admission; sequence generated by hospital or clinic record number; allocation by judgement of the clinician; by

(Continued)

	preference of the participant; based on the results of a laboratory test or a series of tests; by availability of the intervention.
	Unclear: Insufficient information about the sequence generation process to permit judgement.
Allocation concealment Selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment	*Low risk of bias:* Randomisation method described that would not allow investigator/participant to know or influence intervention group before eligible participant entered in the study (e.g. central allocation, including telephone, web-based, and pharmacy-controlled, randomisation; sequentially numbered drug containers of identical appearance; sequentially numbered, opaque, sealed envelopes).
	High risk of bias: Using an open random allocation schedule (e.g. a list of random numbers); assignment envelopes were used without appropriate safeguards (e.g. if envelopes were unsealed or non-opaque or not sequentially numbered); alternation or rotation; date of birth; case record number; any other explicitly unconcealed procedure.
	Unclear: Randomisation stated but no information on method used is available.
Blinding of participants and personnel Performance bias due to knowledge of the allocated interventions by participants and personnel during the study	*Low risk of bias*: No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding; blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken.
	High risk of bias: No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding; blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding.
	Unclear: Insufficient information to permit judgement
Blinding of outcome assessment Detection bias due to knowledge of the allocated interventions by outcome assessors.	*Low risk of bias:* No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding; blinding of outcome assessment ensured, and unlikely that the blinding could have been broken.
	High risk of bias: No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding; blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding.
	Unclear: Insufficient information to permit judgement
Incomplete outcome data Attrition bias due to amount, nature or handling of incomplete outcome data.	*Low risk of bias:* No missing outcome data; reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias); missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups; for dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate; for continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size; missing data have been imputed using appropriate methods.
	High risk of bias: Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups; for dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate; for continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size; 'as-treated' analysis done with substantial departure of the intervention received from that assigned at randomisation; potentially inappropriate application of simple imputation.
	Unclear: Insufficient information to permit judgement

(Continued)

Selective reporting Reporting bias due to selective outcome reporting	*Low risk of bias:* The study protocol is available and all of the study's pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way; the study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon).
	High risk of bias: Not all of the study's pre-specified primary outcomes have been reported; one or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. subscales) that were not pre-specified; one or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect); one or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis; the study report fails to include results for a key outcome that would be expected to have been reported for such a study.
	Unclear: Insufficient information to permit judgement
Other bias Bias due to problems not covered elsewhere in the table	*Low risk of bias:* The study appears to be free of other sources of bias.
	High risk of bias: Had a potential source of bias related to the specific study design used; stopped early due to some data-dependent process (including a formal-stopping rule); had extreme baseline imbalance; has been claimed to have been fraudulent; had some other problem.
	Unclear: Insufficient information to assess whether an important risk of bias exists; insufficient rationale or evidence that an identified problem will introduce bias.

WHAT'S NEW

Date	Event	Description
12 January 2016	New citation required but conclusions have not changed	Compared with the 2006 version of this review, a substantial amount of new information has been included, but there is no change to the main conclusions in this updated review.
12 January 2016	New search has been performed	We have updated the searches to July 2015. We included 26 new trials (1889 participants) in this version. There are now 31 trials, with 2257 participants, included in this updated review.

HISTORY

Protocol first published: Issue 2, 2003
Review first published: Issue 3, 2006

Date	Event	Description
20 October 2008	Amended	Contact details updated
15 July 2008	Amended	Converted to new review format.

CONTRIBUTIONS OF AUTHORS

Wu HM: developing the search strategy, assessment of studies, data extraction, data entry, data analysis, writing of protocol and review.
Yang A: developing the search strategy, assessment of studies, data extraction, data entry, data analysis, writing of review.

Tang JL: data analysis, resolution of disagreements, writing protocol and review.
Xu Li: assessment of studies, data extraction, data entry, suggestions and corrections.
Yang M: data extraction, suggestions and corrections.
Liu GJ: data analysis, suggestions and corrections.

DECLARATIONS OF INTEREST

Ai Yang: none known.
Hong Mei Wu: none known.
Jin-Ling Tang: none known.
Li Xu: none known.
Ming Yang: none known.
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SOURCES OF SUPPORT

Internal sources

- Hong Kong Branch of Chinese Cochrane Center, China.
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External sources

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INDEX TERMS

Medical Subject Headings (MeSH)

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MeSH check words

Humans