



Protocol

An overview of systematic reviews and meta-analyses of acupuncture for dysphagia post-acute stroke: A protocol

Zi-Yu Tian^{a,b}, Xing Liao^{c,**}, Ying Gao^b, Shi-Bing Liang^{a,d}, Chong-Yang Zhang^b, De-Hao Xu^b, Jian-Ping Liu^a, Nicola Robinson^{a,e,*}

^a Center of Evidence Based Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China

^b Dongzhimen Hospital, Beijing University of Chinese Medicine, Beijing, China

^c Center of Evidence Based Traditional Chinese Medicine, Institute of Basic Research in Clinical Medicine, China Academy of Chinese Medical Sciences, Beijing, China

^d Shanxi University of Chinese Medicine, Shanxi, China

^e Department of Allied Health Sciences London South Bank University, Department of Allied Health Sciences, London, United Kingdom

ARTICLE INFO

Keywords:

Acupuncture
Dysphagia
Post-acute stroke
Overview
Protocol
Systematic reviews
Meta-analyses

ABSTRACT

Introduction: The results of previous systematic reviews (SRs) and meta-analyses on acupuncture for post-acute stroke dysphagia have provided conflicting evidence. This systematic review of overviews will aim to summarize and evaluate the quality of the existing SRs and meta-analyses with the aim of identifying whether acupuncture could provide a therapeutic option to treat patients with dysphagia post-acute stroke.

Methods: A systematic search of seven electronic databases (Pubmed, EMBASE, Cochrane library, CNKI, Wanfang, SinoMed and VIP) will be performed according to a predefined search strategy for SRs and meta-analyses of randomized controlled trials (RCTs) and quasi-RCTs on acupuncture for dysphagia post-acute stroke.

Two authors will independently select SRs and meta-analyses and collect appropriate data. The reporting quality of included SRs and meta-analyses will be assessed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The revised Assessment of Multiple Systematic Reviews (AMSTAR 2) will be used to assess the quality of the SRs and meta-analyses. If necessary, GRADE will be used to rate the quality of evidence.

Results: This overview will identify current SRs and meta-analyses of RCTs or quasi-RCTs of acupuncture treatment for dysphagia post-acute stroke.

Discussion: The current evidence will be evaluated to help answer the question - is acupuncture a potentially effective treatment for dysphagia after stroke?

Prospero Registration Number CRD42019134163.

1. Introduction

In 2016, according to the Global Burden of Disease study [1], the global lifetime risk of stroke, irrespective of gender was approximately 25% for those over the age of 25 years. Death caused by stroke ranks second as a leading cause of adult mortality and disability [2]. Meanwhile between 37% to 78% of stroke survivors will suffer from dysphagia, exhibiting clinical symptoms such as coughing or difficulty swallowing when drinking water, or eating slowly [3], resulting in re-

duction in quality of life. In addition, it may also further threaten their life through dehydration, pneumonia or chest infection resulting from misaspiration, or in some cases may even lead to death [3,4].

Guidelines recommend early screening of post-acute stroke patients to prevent disability, pneumonia or chest infection and death after stroke [5]. However it is still uncertain whether this can reduce these risks, because the current screening strategy for dysphagia after stroke will rely not only on their accuracy and reliability but also on the management interventions adopted [6]. Thus there are substantial in-

* Corresponding author at: London South Bank University, United Kingdom

** Corresponding author at: Center of Evidence Based Traditional Chinese Medicine, Institute of Basic Research in Clinical Medicine, China Academy of Chinese Medical Sciences, Beijing, China.

E-mail addresses: okfrom2008@hotmail.com (X. Liao), nicky.robinson@lsbu.ac.uk (N. Robinson).

<https://doi.org/10.1016/j.eujim.2019.100956>

Received 12 June 2019; Received in revised form 1 August 2019; Accepted 3 August 2019

1876-3820/© 2019 Elsevier GmbH. All rights reserved.

creasing economic costs for care and rehabilitation after stroke [2].

Acupuncture, which has been widely used for rehabilitation after stroke, has also been specifically used for dysphagia after stroke. Systematic reviews (SRs) and meta-analyses of randomized controlled trials (RCTs) are recognized as the best way to assess the healthcare interventions. A Cochrane SR published in 2012, reported that acupuncture can reduce the prevalence of dysphagia, alleviate clinical symptoms such as difficulty swallowing and improve the life quality of patients [7]. However the latest updated Cochrane review on swallowing therapy, included acupuncture and failed to show a significant effect on the outcomes of dependency/disability, misaspiration rate or death [8].

Systematic reviews and meta analyses on the use of acupuncture for symptoms of post-acute stroke or stroke-related disorders have been published, but there are some different and conflicting results. Several overviews of these SRs have been performed to identify effective treatment, but there is no specific overview focusing on the SRs and meta-analyses on acupuncture for dysphagia post-acute stroke. This overview is aimed to specifically assess the current evidence quality of SRs and meta-analyses about the effectiveness of acupuncture for dysphagia after stroke.

2. Methods

2.1. Protocol and registration

The method used for this protocol will be performed according to the criteria for conducting overviews of SRs and meta-analyses given in the Cochrane Handbook of Systematic Reviews of Interventions and “Preferred Reporting Items for Systematic Review [9]. This protocol of overview has been registered on the International prospective register of systematic reviews (PROSPERO: CRD42019134163). As this review will only include published SRs and meta analyses, ethics approval is not necessary.

2.2. Types of reviews

This study will include published SRs and meta-analyses of RCTs or quasi-RCTs that have explored the effects of acupuncture alone or combination with other treatments. The SRs and meta-analyses that will be included must report the results of the effect of an acupuncture intervention on dysphagia post-acute stroke.

2.3. Type of population

There will be no restrictions on the populations included in this study. We will include all reviews of acupuncture for dysphagia post-acute stroke.

2.4. Types of intervention

The intervention will include acupuncture (including electro-acupuncture) alone or in combination with other treatments (including placebo, routine therapy, western medicine or rehabilitation training).

2.5. Types of comparisons

The comparison treatment will include: sham-acupuncture, herbal, routine therapy, western medicine or rehabilitation training.

2.6. Types of outcomes

The primary outcomes of this overview will be any effect-related

outcomes such as: swallowing ability (assessed by fiberoptic endoscopic examination of swallowing (FEES) or a video fluoroscopic swallowing study (VFSS) or incidence of pneumonia/chest infection at the end of the trial. Secondary outcomes will be death, water swallow test, penetration aspiration score, functional oral intake scale (FOIS) at the end of the trial, or the length of inpatient stay.

2.7. Search strategy for identification of SRs and meta-analyses

Seven major Chinese and English electronic databases will be systematically searched for published SRs and meta-analyses from their inception to May 27th 2019. These will include: Wanfang Database and China Science Technology Journal Database (VIP), Sino-Med Database (including China Biology Medicine disc (CBM)), EMBASE, PubMed, the Cochrane Library and China National Knowledge Infrastructure (CNKI). The detailed search strategy in PubMed is given in Appendix B.

2.7.1. Selection of studies

Two authors will respectively select studies by titles and abstracts according to the predefined eligibility criteria to identify relevant SRs and meta-analyses and then full texts reviews will be independently screened before final inclusion. Any disagreements between the two authors will be resolved through discussion and consultation with a third author if necessary (Appendix A: Fig. 1).

2.7.2. Data extraction

Two reviewers will respectively extract the data of all included SRs and meta-analyses following the predefined data extraction tables. Any disagreements between the two reviewers will be resolved through discussion and consultation with a third author if necessary. Data extraction tables will be established by Excel software. The following data from all included SRs and meta-analyses will be as follows: study characteristics of first author name, number of authors with an evidence based medicine (EBM) background, number of authors, year of publication, journal name, number of primary studies and patients, interventions, country of first author, adverse effects, outcomes, conclusions.

2.7.3. Data synthesis and presentation

We will enter the extracted data of the included SRs and meta-analyses and data will be presented as percentages and frequencies. Relative risk (RR) or odds ratios (OR) will be used when the effect value is a binary variable in the systematic review. If the effect value is a continuous variable, the mean difference (MD) or standard mean difference (SMD) will be used.

Summary tables will be used to provide data in a structured format. Outcomes which are not quantitative will be descriptively reported. The results on the quality of evidence, quality of reviews and effect sizes will be presented graphically. If the same RCTs are being included in different SRs or meta-analysis, which yield different interpretations we will only assess the methodological quality and reporting quality of these studies.

2.8. Subgroup analysis

Subgroup analyses will be conducted as follows: populations of patients (such as acute or convalescent period of stroke), interventions (acupuncture or electro-acupuncture alone/acupuncture or electro-acupuncture combined with other treatments), comparisons, outcomes and study designs.

2.9. Quality assessment

2.9.1. Methodological quality

The Assessment of Multiple Systematic Reviews 2 (AMSTAR2) will be used to evaluate the methodological quality of the included systematic reviews and meta-analyses. AMSTAR is a quality assessment tool and will be used just for SRs of randomized controlled trials, while AMSTAR2 is an update of AMSTAR, which can be used to appraise SRs of intervention trials including both randomized and non-randomized controlled trials [10]. There are 16 items in the scale. Items 2, 4, 7, 9, 11, 13 and 15 which are considered to be critical items affecting the production of the system review and the validity of the results, while other items are considered as non-critical items. The overall quality of SRs and meta-analyses will be evaluated as follows: the quality of the SR and meta-analysis will be assessed as high if there is no or just one non-critical weakness; moderate if there is more than one non-critical weakness; low if there is just one critical flaw, no matter with or without non-critical weaknesses; critically low if there is more than one critical flaw, no matter with or without non-critical weaknesses.

Two authors will respectively assess the methodological quality of each included SR and meta-analysis by using the AMSTAR2 tool. The 16 criteria will be assessed of 'Yes' (items are answered completely and meet the requirements of the sub-items), 'No' (items are absent or evaluation is inappropriate), or 'Partial yes' (done some of the items). Any discrepancies in the ratings of the each criteria will be resolved by discussion or a third author will be consulted if necessary.

2.9.2. Quality of the evidence

The tool for assessing the quality of the included evidence will be extracted. If no tool has been used, we will use GRADE to assess the quality of body of evidence in these SRs and meta-analyses and judgments will be made whether to upgrade or downgrade the quality level, according to the GRADE working group criteria [11]. Any discrepancies in the ratings of the GRADE will be resolved by discussion or a third author will be consulted if necessary.

2.9.3. Reporting quality

The reporting quality of the SRs and meta-analyses will be assessed by the internationally recognized PRISMA statement [12]. The 27 items are used to assess whether the reports are standardized or not. Any discrepancies between the two authors will be resolved by discussion, or if necessary, judgment will be made by a third author.

3. Possible limitations

Although this overview will be conducted by systematically searching strategies of seven databases (English and Chinese), relevant SRs and meta-analyses, systematic reviews published in other languages may be missed, but the likelihood of this is thought to be minimal.

4. Results in the final overview

The current SRs and meta-analyses of RCTs or quasi-RCT of acupuncture treatment for dysphagia after stroke will be identified and the results will be presented, including the basic characteristics of the included SRs or meta-analyses, the quality of the systematic reviews.

5. Discussion

Several SRs and meta-analyses investigating the acupuncture treatment for the dysphagia post-acute stroke have been published but have reached different conclusions [7,8,13–15]. One review suggested that acupuncture may offer additional benefits in rehabilitation medicine [16]. While low quality evidence has shown that acupuncture significantly resulted in reducing the number of stroke patients with dysphagia at the end of the trial, acupuncture did not improve swallowing function of the patients [8]. Another meta-analysis showed that the recent evidence supported the effectiveness and safety of acupuncture in the treatment dysphagia post-acute stroke in the short-term compared to rehabilitation training or medication [14].

An overview of SRs and meta-analyses of acupuncture post-acute stroke [17] systematically reviewed published SRs and meta-analyses of acupuncture for stroke and stroke-related disorders using the Overview Quality Assessment Questionnaires (OQAQ). It showed that acupuncture therapy could significantly improve clinical symptoms in the severity of dysphagia when combined the results of video-fluoroscopic swallowing study (VFSS) and water-swallowing test, and the improvement was even greater when only water-swallowing test results were considered, but the quality of evidence in this study was not rated by GRADE or any other tools used for assessing evidence of quality.

Thus to address these evidence gaps and to support decision making, it is necessary to conduct a comprehensive overview of the evidence on the current systematic reviews and meta-analyses. This study will undertake an overview of SRs and meta-analyses of acupuncture for dysphagia post-acute stroke using PRISMA and AMSTAR2. As there is no item aimed at the GRADE assessment for SRs and meta-analyses in AMSTAR2, we will also use GRADE to assess the overall quality of evidence for the outcomes of the identified SRs and meta-analyses if necessary.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding

This work was supported by National Natural Science Foundation of China (grant number 81774159). Professor Robinson is supported by the Overseas Expertise Project, Ministry of Education of China, Beijing University of Chinese Medicine (grant number MS20180009).

Contributors

NR conceptualized the study, XL and NR designed the study and organized the team. ZYT and XL designed the literature search, developed and refined the study protocol. JPL gave methodological help and YG gave clinical suggestions. CYZ and DHX will undertake study selection and data extraction, ZYT and SBL will undertake evidence quality with GRADE, methodological quality with AMSTAR2 and reporting quality with PRISMA. ZYT will undertake analysis, interpretation and report writing. NR and XL will draft the publication and all authors will be asked to comment and revise. All authors have read and approved this manuscript.

Appendix A. Fig. 1

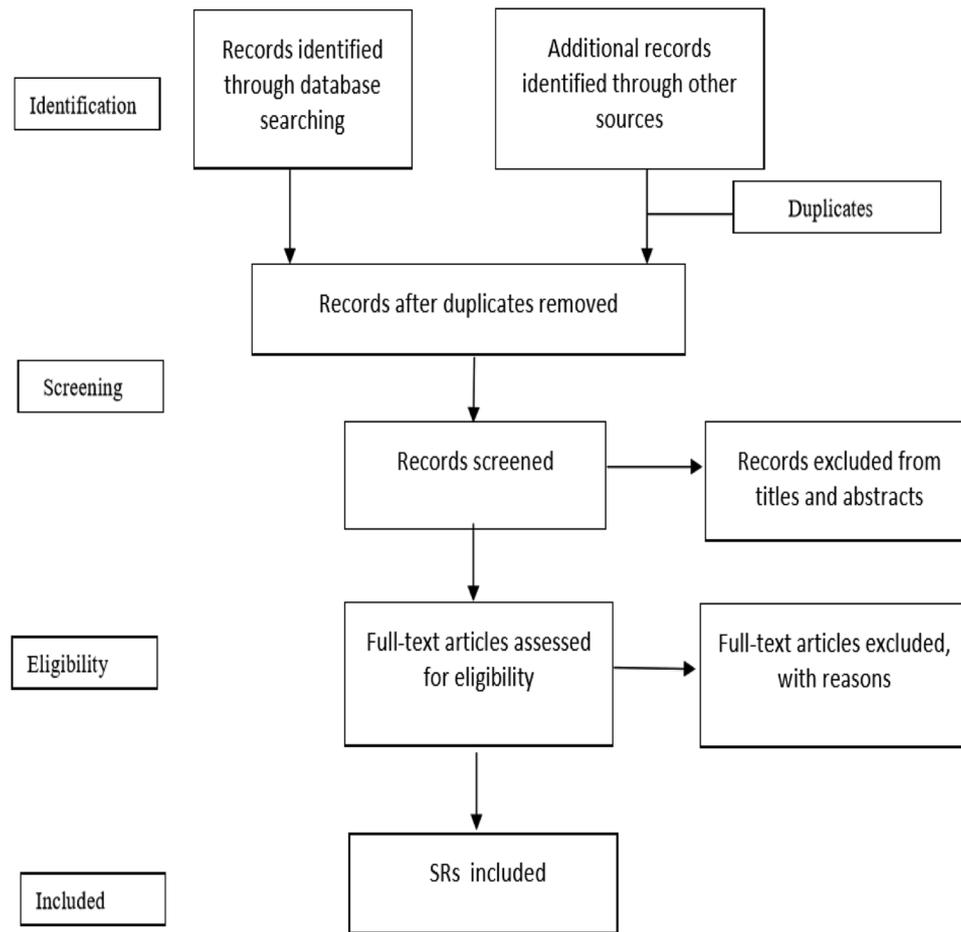


Fig. 1. Flow chart of literature selection.

Appendix B

Searching strategy on PubMed

- #1 Deglutition Disorders [Title/Abstract]
- #2 Deglutition Disorder [Title/Abstract]
- #3 Dysphagia [Title/Abstract]
- #4 Disorders, Deglutition [Title/Abstract]
- #5 Swallowing Disorders [Title/Abstract]
- #6 Swallowing Disorder
- #7 Swallowing difficult? [Title/Abstract]
- #8 Swallowing dysfunction [Title/Abstract]
- #9 Oropharyngeal [Title/Abstract]
- #10 Dysphagia, Oropharyngeal [Title/Abstract]
- #11 Esophageal [Title/Abstract]
- #12 Dysphagia, Esophageal [Title/Abstract]
- #13 Deglutition [Title/Abstract]
- #14 Pseudobulbar Palsy [Title/Abstract]
- #15 Pseudobulbar Palsies [Title/Abstract]
- #16 Pseudobulbar Paresis [Title/Abstract]
- #17 Spastic Bulbar Palsy [Title/Abstract]
- #18 Spastic Bulbar Palsies [Title/Abstract]
- #19 Bulbar Palsies, Spastic [Title/Abstract]
- #20 Bulbar Palsy, Spastic [Title/Abstract]
- #21 Palsies, Spastic Bulbar [Title/Abstract]

#22 Palsy, Spastic Bulbar [Title/Abstract]
 #23 or/1-22
 #24 Stroke [ms]
 #25 Stroke? [Title/Abstract]
 #26 post?stroke [Title/Abstract]
 #27 Cerebrovascular Accident? [Title/Abstract]
 #28 CVA (Cerebrovascular Accident) [Title/Abstract]
 #29 CVAs (Cerebrovascular Accidents) [Title/Abstract]
 #30 Cerebrovascular Apoplexy [Title/Abstract]
 #31 Apoplexy, Cerebrovascular [Title/Abstract]
 #32 Vascular Accident?, Brain [Title/Abstract]
 #33 Brain Vascular Accident [Title/Abstract]
 #34 Brain Vascular Accidents [Title/Abstract]
 #35 Vascular Accidents, Brain [Title/Abstract]
 #36 Cerebrovascular Stroke? [Title/Abstract]
 #37 Stroke?, Cerebrovascular [Title/Abstract]
 #38 Apoplexy [Title/Abstract]
 #39 Cerebral Stroke [Title/Abstract]
 #40 Cerebral Stroke? [Title/Abstract]
 #41 Stroke, Cerebral [Title/Abstract]
 #42 Acute Cerebrovascular Accident? [Title/Abstract]
 #43 Cerebrovascular Accident?, Acute [Title/Abstract]
 #44 Cerebral infraction [Title/Abstract]
 #45 Brain infraction [Title/Abstract]
 #46 Cerebral embolism [Title/Abstract]
 #47 or/24-46
 #48 systematic review [Title/Abstract]
 #49 Review [Title/Abstract]
 #50 Meta-Analysis [Title/Abstract]
 #51 Meta Analysis [Title/Abstract]
 #52 Data Pooling [Title/Abstract]
 #53 Data Poolings [Title/Abstract]
 #54 Overviews, Clinical Trial [Title/Abstract]
 #55 Clinical Trial Overviews [Title/Abstract]
 #56 Clinical Trial Overview [Title/Abstract]
 #57 Overview, Clinical Trial [Title/Abstract]
 #58 or/48-57
 #59 Acupuncture Treatment [Title/Abstract]
 #60 Acupuncture Treatment? [Title/Abstract]
 #61 Acupuncture [Title/Abstract]
 #62 Acupuncture Therapy [Title/Abstract]
 #63 Therapy, Acupuncture [Title/Abstract]
 #64 Pharmacopuncture [Title/Abstract]
 #65 Electroacupuncture [Title/Abstract]
 #66 Point [Title/Abstract]
 #67 Acupoint [Title/Abstract]
 #68 or/59-67
 #69 23 and 47
 #70 69 and 58
 #71 70 and 68

References

- [1] GBD 2016 Causes of Death Collaborators, Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the global burden of disease study 2016, *Lancet* 390 (2017) 1151–1210.
- [2] GBD 2016 Stroke Collaborators, Global, regional, and national burden of stroke, 1990–2016: a systematic analysis for the global burden of disease study 2016, *Lancet Neurol.* 18 (5) (2019) 439–458.
- [3] R. Martino, N. Foley, S. Bhogal, N. Diamant, M. Speechley, R. Teasell, Dysphagia after stroke: incidence, diagnosis, and pulmonary complications, *Stroke* 36 (2005) 2756–2763.
- [4] M. Arnold, K. Liesirova, A. Broeg-Morvay, J. Meisterernst, M. Schlager, M.L. Mono, et al., Dysphagia in acute stroke: incidence, burden and impact on clinical outcome, *PLoS One* 11 (2016) e0148424.
- [5] W.J. Powers, A.A. Rabinstein, T. Ackerson, on behalf of the American Heart Association Stroke Council, et al., 2018 guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association, *Stroke* 49 (2018) e46–e110.
- [6] E.E. Smith, D.M. Kent, K.R. Bulsara, et al., Effect of dysphagia screening strategies on clinical outcomes after stroke: a systematic review for the 2018 guidelines for the early management of patients with acute ischemic stroke, *Stroke* Mar 49 (3) (2018) e123–e128.
- [7] C. Geeganage, J. Beavan, S. Ellender, P.M. Bath, Interventions for dysphagia and nutritional support in acute and subacute stroke, *Cochrane Database Syst. Rev.* 10 (2012) CD000323.
- [8] P.M. Bath, H.S. Lee, L.F. Everton, Swallowing therapy for dysphagia in acute and subacute stroke, *Cochrane Database Syst. Rev.* 10 (October) (2018) CD000323.
- [9] L.A. Becker, A.D. Oxman, Chapter 22: overviews of reviews, in: J.P.T. Higgins, S. Green (Eds.), *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0*, The Cochrane Collaboration, 2011 (Accessed 27 February 2015), http://handbook.cochrane.org/chapter_22/22_overviews_of_reviews.htm.
- [10] B.J. Shea, B.C. Reeves, G. Wells, et al., AMSTAR2: a critical appraisal tool for systematic reviews that include randomized or non-randomised studies of healthcare interventions, or both, *BMJ* 358 (2017).

- [11] GRADE guidelines—best practices using the GRADE framework, 2012. http://www.gradeworkinggroup.org/publications/JCE_series.htm.
- [12] D. Moher, A. Liberati, J. Tetzlaff, D.G. Altman, The PRISMA Group, Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement, *BMJ* 339 (2009) (2009) b2535, <https://doi.org/10.1136/bmj.b2535>.
- [13] L.X. Li, K. Deng, Acupuncture combined with swallowing training for poststroke dysphagia: a meta-analysis of randomised controlled trials, *Acupunct. Med.* (March) (2019) acupmed2016011305.
- [14] L.X. Li, K. Deng, Y. Qu, Acupuncture treatment for post-stroke dysphagia: an update meta-analysis of randomized controlled trials, *Chin. J. Integr. Med.* 24 (September (9)) (2018) 686–695.
- [15] Y.B. Long, X.P. Wu, A meta-analysis of the efficacy of acupuncture in treating dysphagia in patients with a stroke, *Acupunct. Med.* 30 (December (4)) (2012) 291–297.
- [16] Feng Sun, Jinchun Wang, Xia Wen, Acupuncture in stroke rehabilitation, *Neural Regen. Res.* 7 (May (15)) (2012) 1192–1199.
- [17] J.H. Zhang, D. Wang, M. Liu, Overview of systematic reviews and meta-analyses of acupuncture for stroke, *Neuroepidemiology* 42 (1) (2014) 50–58.