Review Article
Systematic Review on Acupuncture for Treatment of Dysphagia after Stroke

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Objective. To assess the therapeutic efficacy of acupuncture for dysphagia after stroke. Methods. Seven electronic databases were searched from their inception until 31 September 2016. All randomized controlled trials (RCTs) incorporating acupuncture or acupuncture combined with other interventions for treatment of dysphagia after stroke were enrolled. Then they were extracted and assessed by two independent evaluators. Direct comparisons were conducted in RevMan 5.3.0 software. Results. 6010 patients of 71 papers were included. The pooled analysis of efficacy rate of 58 studies indicated that acupuncture group was superior to the control group with moderate heterogeneity (RR = 1.17, 95% CI: 1.13–1.21, Z = 9.08, and P < 0.00001); meta-analysis of the studies using blind method showed that the efficacy rate of acupuncture group was 3.01 times that of control group with no heterogeneity (RR = 3.01, 95% CI: 1.95–4.65, Z = 4.97, and P < 0.00001). Only 13 studies mentioned the safety evaluation. Conclusion. The result showed that the acupuncture group was better than control group in terms of efficacy rate of dysphagia after stroke. And the combining result of those researches using blind method was more strong in proof. Strict evaluation standard and high-quality RCT design are necessary for further exploration.

1. Introduction

Dysphagia was one of the most common sequelae after stroke. The incidence reached 81% [1]. There were many complications in dysphagia, such as cacotrophy [2], dehydration, aspiration, and pneumonia [3]. Those complications improve the morbidity, mortality, the rehabilitation, and the quality of life of the patients. So the medication and intervention time are very important for recovery. Acupuncture was an effective method and more and more welcomed and applied clinically [4]. There were many studies [5–7] about the acupuncture for treatment of dysphagia after stroke internationally, including the scalp acupuncture, nape needle, auricular needling, or combing with other methods.

Though, there were some systematic reviews focusing on the acupuncture for treatment of dysphagia in stroke. There was lack of higher quality research or the positive conclusion could not be obtained. Thus, the inclusion and exclusion criteria were formulated after integrating the previous relevant reports. And the studies using single blind method were pooled to be analysed alone.

2. Method and Data

The criterion of systematic review was published in the Cochrane Collaboration which was available on http://hand-book.cochrane.org/.

2.1. Type of Studies. All articles were included that reported an RCT in patients with dysphagia after stoke. And the animal experiments were not inclusive.

2.2. Participants. All the patients should conform to the explicit clinical diagnosis criteria of stroke and dysphagia. They should meet the following diagnosis of stroke: (1) the diagnostic criterion of the Fourth National Conference on cerebrovascular diseases in 1994 or the revised diagnostic criterion in 1995 or 1996; (2) the revised “Various Types of Cerebrovascular Disease Diagnosis Points” of The Fourth National Conference on cerebrovascular diseases of Chinese Medicine Association; (3) the “Chinese Cerebrovascular Disease Prevention And Treatment Guidelines (Try Out)” established by Neurology Branch of Chinese Medical Association.
2. Interventions. For the intervention in acupuncture group, acupuncture alone or combined with other interventions was all included, such as the rehabilitation training, swallowing therapeutic apparatus, swallowing training, and electrical stimulation. There was no distinction for the acupuncture manipulation, acupoint, stimulation intensity, and course of treatment. It is available for blank control group, drugs, or rehabilitation training in control group.

2.4. Outcome Measurement. The clinical symptoms had obviously improved with specific evaluation criteria such as the (1) Watian Swallowing Test (WST) [10]; (2) Standardized Swallowing Assessment (SSA) [11]; (3) Ichiro Fujishima Rating Scale (IFRS) [12]; (4) Caiteng 7 Rank for dysphagia [13] or with using the objective index as the efficacy evaluation scale of TCM diagnosis for stroke; (9) confirmed by head CT or MRI and other imaging methods for stroke; (10) Summary of the Sixth National Conference on cerebrovascular diseases.

3. Result

71 studies including 6010 patients were enrolled finally. There were 2991 participants in acupuncture group and 3019 participants in control group.

3.1. The Basic Characteristics. Two groups were compared statistically based on age, gender, duration, and degree of dysphagia. And the baseline was comparable. See Table 2; 12 studies used the complete random and allocation concealment; 10 studies used the single blind method in the outcome assessment and statistics analysis. For the incomplete outcome data, 12 studies reported the fall off and exit of patients without any effect on the result; 17 studies mentioned the funding support, and not the others.

3.2. Data Analysis. RevMan 5.3.0 software was used for data analysis. And the different outcome assessment indicators were used to be classified and analysed. They were presented as risk ratio (RR) or mean difference (MD) with a 95% confidence interval.

3.3. Efficacy Rate. 62 studies used the clinical efficacy rate as the evaluation indicator with the dichotomous data. So the risk ratio (RR) was used to show the result. We found the medium heterogeneity ($I^2 = 68\%$) after combining data. We could observe from the funnel plot that 3 studies [19, 31, 82] had deviated from the center line. After sensitivity analysis, we found that one study [19] considered the significantly effective result as recovery and the other as invalidation, which led to difference in results. At the same time, the intervention group of the two studies [31, 82] was treated with acupuncture combined with western medicine. And the curative effect was significantly higher than that of the control group. All the dots were equally distributed on both sides of the dashed line in the funnel plot with no publication bias after removing them (Figure 4). The moderate heterogeneity was found after remerging ($I^2 = 58\%$). So we chose the random effect model (Figure 5). The pooled analysis showed that the total rectangle was on the right of the equivalent line, which indicated the curative effect of acupuncture group was

### Table 1: Retrieved literatures.

| Database       | CNKI | WanFang | CSJD | CBM | PubMed | EMBASE | Cochrane | SCI |
|----------------|------|---------|------|-----|--------|--------|----------|-----|
| Number         | 1361 | 1451    | 593  | 388 | 41     | 0      | 2        | 13  |
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Records identified through electronic search (n = 3849)
Records through other search (n = 0)

Record after duplication (n = 2877)
Obviously inconsistent with the theme (n = 1811)

Record Screened (n = 1076)
Record excluded (n = 792)

Excluded studies (n = 213) reason: unclear diagnosis (n = 7), not RCT or quasi-RCT studies (n = 183), electro-acupuncture in control group (n = 3), no random (n = 9), incomplete data (n = 4), no effective indicator (n = 2), no comparability in data (n = 5)

Consulted the full text (n = 284)

Eligible studies (n = 71)

Included the qualitative studies (n = 70)

**Figure 1:** The screening flow diagram.

better than the control group (RR = 1.17, 95% CI: 1.13–1.21, Z = 9.08, and P < 0.00001).

3.4. **Standard Swallowing Assessment (SSA).** There were 11 studies that used the SSA as the effective evaluation standard with the continuous data. The meta-analysis of them was showed in mean difference with high heterogeneity (I² = 83%). So the random effect model was used (Figure 6). The figure showed that acupuncture group could lower the SSA scores (MD = 3.7, 95% CI: −4.93 to −2.48, Z = 5.94, and P < 0.00001).

3.5. **Watian Swallowing Test.** The Watian Swallowing Test was used in 24 studies; 9 of them used the dichotomous data. The risk ratio was selected to demonstrate the count data. The results (Figure 7) showed high heterogeneity (I² = 87%). Hence the random effect model was used. And the rectangle was on the right of the equivalent line, which indicated that acupuncture group could improve the efficacy of dysphagia after stroke (RR = 1.25, 95% CI: 1.03–1.50, Z = 2.31, and P = 0.02 < 0.05).

15 studies used the continuous data. And the mean difference was applied. The results showed that the heterogeneity of the merger was large. So we did the subgroup analysis according to the course of disease. Then the heterogeneity decreased from 95% to 67.4% (Figure 8). There was no publication bias in the funnel plot (Figure 9). Meanwhile, the pooled analysis showed that the acupuncture could lower the Watian Swallowing Test score (MD = 0.97, 95% CI: −1.11 to −0.47, Z = 4.82, and P < 0.00001).

3.6. **Swallowing Functional Assessment.** Among the included studies, 8 of them used the Swallowing Functional Assessment to evaluate the effectiveness of treatment with the continuous data. The result (Figure 10) exhibited the medium heterogeneity (I² = 65%) with mean difference (MD). The result explained that acupuncture could improve the
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swallowing function with the random effect model (MD = 1.48, 95% CI: 1.18 1.79, Z = 9.59, and P < 0.0001).

3.7. Swallowing Disorder Integral. 5 studies selected the swallowing disorder scoring as evaluated standard. The meta-analysis of the 5 dichotomous data sets showed that the heterogeneity decreased from 85% to 40% after removing one study [59]. The sensitivity analysis indicated that the heterogeneity might be the treatment course of this study which was longer than the others. We could see from the figure that the score of the control group was higher than the acupuncture group (Figure 11). It illustrated that acupuncture group was able to lower the swallowing disorder integral (MD = −0.71, 95% CI: −1.08 −0.33, Z = 3.7, and P = 0.0002).

3.8. Swallowing-Related Quality of Life (SWAL-QOL). 5 studies used the SWAL-QOL to express the Swallowing-Related Quality of Life before and after treatment. They all used the continuous data and mean difference to exhibit the results. The pooled analysis showed that rectangle was intersected with the equivalent line with high heterogeneity (I² = 100%), which means nothing (Figure 12).

3.9. Activities of Daily Living (ADL). 2 studies [67, 78] used ADL to express the curative effect, two [27, 45] used the Barthel index, and the other one [54] used modified Barthel index. Among them, the activities of daily living before and after treatment were showed using the continuous data and mean difference. The meta-analysis indicted that acupuncture group obviously improved the activities of daily living of the patients with lower heterogeneity (I² = 22%) (Figure 13). And it was 7.31 times as much as the control group (MD = 7.46, 95% CI: 5.49 9.47, Z = 7.31, and P < 0.0001).

3.10. Cai teng 7 Rank (CT7R). The CT7R was used in 2 studies [48, 87] with dichotomous and risk ratio. There was no heterogeneity (I² = 0%) after combining the data with the fixed effect model (Figure 14), which indicated that the Cai teng 7 Rank scores of the acupuncture group were higher than the control group (RR = 1.22, 95% CI: 1.04 1.42, Z = 2.49, and P = 0.01).

The pooled analysis (Figure 15) of the 2 studies [44, 56] using Ichiro Fujishima Rating Scale (IFRS) showed no meaning with medium heterogeneity (I² = 69%), neither the result of 2 studies [17, 45] using mini-nutritional assessment (MNA). Only one study [54] used Hamilton Depression Scale (HAM-D), which showed that the depression degree of acupuncture group was lighter than the control group.

3.11. Blind Method Analysis. We extracted 7 studies using blind method from the enrolled studies, among which 4 studies used the clinical therapeutic efficiency and 5 used Watian Swallowing Test efficacy rate. There was no heterogeneity (I² = 0%) after pooling them with dichotomous data and risk ratio (RR) (Figure 16). So the fixed effect model was used. The rectangle was on the right of equivalent line and the therapeutic efficiency of acupuncture group was 3.01 times
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Random sequence generation (selection bias)
Allocation concealment (selection bias)
Blinding of participants and personnel (performance bias)
Blinding of outcome assessment (detection bias)
Incomplete outcome data (attrition bias)
Selective reporting (reporting bias)
Other bias

Low risk of bias
Unclear risk of bias
High risk of bias

Figure 3: The summary of bias evaluation for the studies.

Figure 4: The funnel plot of clinical efficacy rate.

as much as the control group. The result indicated that the acupuncture group could improve the therapeutic efficiency of dysphagia after stroke (RR = 3.01, 95% CI: 1.95 4.65, Z = 4.97, and P < 0.00001).

Among the studies employing blind method, 4 of them used the SSA as the assessment indicator with continuous data and mean difference (MD). High heterogeneity was found after combined analysis. Sensitivity analysis revealed that heterogeneity might be due to the use of the test method and the gender imbalance in the clinical cases from one study [17]. The heterogeneity was lower (I² = 21%) after removing it. We could see from the figure (Figure 17) that the rectangle was on the left of equivalent line, with a trend that acupuncture group could lower the SSA scores (MD = −4.47, 95% CI: −6.59 −3.36, Z = 7.85, and P < 0.00001).

3.12. Adverse Reactions Report. Only 13 studies mentioned the security index, including how to prevent the subcutaneous hemorrhage, needle sickness, curved needle, broken needle, and the handing method during acupuncture process. Meanwhile, some studies reported the influence caused by the adverse reactions, not the others.

4. Discussion

The study indicated that the therapeutic efficacy of acupuncture or acupuncture combined with other intervention was better than the control group, though some pooled results had higher heterogeneity. The interventions such as the acupuncture, rehabilitation training, and swallowing training were related to the professional skill of the practitioners, the same as the efficacy evaluation. Meanwhile, the various source of cases might lead to difference statistic results.

4.1. Comparison with Other Literatures. The acupuncture alone or combined with other interventions is widely used for dysphagia after stroke in China. There exists some evidence about the acupuncture for dysphagia after stroke. One report [88] stated although acupuncture had a tendency to improve dysphagia after stroke, it could not get the positive conclusion. There was report [89] which indicated that acupuncture combined with the swallowing rehabilitation training had certain advantage. Long and Wu [90] pointed out that acupuncture may be benefit for dysphagia, but high-quality research was needed. The present study reworked out inclusion and exclusion criteria to evaluate the efficacy of acupuncture for treatment of dysphagia after stroke and showed stronger evidence in the result.

4.2. Strengths and Limitations. In this paper, the studies included single blind method pooled to analysis alone and showed stronger evidence on acupuncture for treatment of dysphagia after stroke. We incorporated all researches in the past 5 years. Considering the clinical application of the intervention in this paper was special, such as the feeling of the patient. It was difficult to achieve true double blind. The studies using single blind method achieved the blind method to some extent. There was no or lower heterogeneity after combining.
| Reference               | Simple size (T/C/M/F) | Design/blind | Diagnostic criteria | Intervention | Control | Mean age (T/C) | Treatment course | Outcome measures |
|-------------------------|-----------------------|--------------|---------------------|--------------|---------|----------------|------------------|------------------|
| Luo et al. [17] 2015    | 33/29 62/62 (35/27)/62 (36/26) | RCT/single blind | FNCOCD-1994 | A + BT + RT | BT + RT | 68.45 ± 9.73/66.90 ± 11.55 | 38.82 ± 48.77/27.14 ± 47.30 | SSA + MNA |
| Xia et al. [18] 2015    | 70/70 (39/33)/70 (28/32) | RCT/single blind | FNCOCD-1994 | A | BT + RT | 66.0 ± 8.4/68.4 ± 9.1 | 64.7 ± 32.0/60.0 ± 36.0 | WST |
| Xie et al. [19] 2011    | 18/18/18 (10/8)/18 (11/9) | RCT/single blind | FNCOCD-1994 | A + ST + ES | ST + ES | 69.52 ± 6.01/65.41 ± 7.01 | 25.60 ± 3.09/24.32 ± 2.78 | WST + IFRS |
| Yinc et al. [20] 2011   | 2015 | RCT/single blind | FNCOCD-1994 | A + ST | 68.45 ± 9.73/66.90 ± 11.55 | 38.82 ± 48.77/27.14 ± 47.30 | SSA + MNA |
| Zhanget al. [21] 2014   | 29/29 (9/22)/29 (11/9) | RCT/single blind | FNCOCD-1994 | A + TC + RT | BT + RT | 65.55 ± 7.05/62.21 ± 8.37 | 42.56 ± 14.26/45.12 ± 12.56 | SSA + DOSS |
| Wang [22] 2016          | 30/30 (18/14)/30 (17/13) | RCT/single blind | FNCOCD-1994 | A + BT + ES | BT + ES | 63.81 ± 6.01/65.41 ± 7.01 | 25.60 ± 3.09/24.32 ± 2.78 | WST |
| Li and Bai [23] 2015    | 32/32 (22/10)/32 (20/10) | RCT/single blind | FNCOCD-1994 | A + BT + RT | BT + RT | 55.17 ± 4.73/54.97 ± 5.46 | NR | WST |
| Liu [24] 2014           | 39/39 (16/23)/39 (19/20) | RCT/single blind | FNCOCD-1994 | A + BT + RT | BT | 61.65 ± 8.25/63.71 ± 7.12 | 4.56 ± 4.29/4.18 ± 4.19 | SSA |
| Hang et al. [25] 2014   | 30/30 (16/14)/30 (13/15) | RCT/single blind | FNCOCD-1994 | A + BT + OPT | BT | 56.36 ± 10.55/56.36 ± 10.55 | 17.36 ± 15.52/19.49 ± 16.91 | SSA + WST + NIHSS + Barthel |
| Chen et al. [26] 2009   | 82/82 (59/23)/82 (53/28) | RCT/no blind | FNCOCD-1995 | A + RT | RT | WST | SSA |
| Chen and Zhang [27] 2014 | 30/30 (16/14)/30 (13/15) | RCT/no blind | CCDPATGNNBCMA-2007 | A + RT | RT | 61.63 ± 10.87/60.90 ± 10.53 | 47.68 ± 41.63 d | WST |
| Chen et al. [28] 2016   | 168/168 (17/1)/168 (13/4) | RCT/no blind | SOSNOCD-2004 | A + RT + BT | BT + RT | 64.40 ± 11.20/64.05 ± 11.35 | 35.29 ± 32.84/33.12 ± 29.12 | SSA + TIFRS |
| Wang [30] 2013          | 30/30 (16/14)/30 (13/15) | RCT/no blind | FNCOCD-1996 | A + BT + TCM | BT | 65.3 ± 8.2/66.4 ± 5.4 | 14.98 ± 13.02/15.79 ± 13.76 | SSA |
| Duan [31] 2014          | 40/40 (24/6)/40 (20/5) | RCT/no blind | FNCOCD-1994 | A + SM + BT | BT | 52.5 ± 3.7/52.5 ± 3.7 | NR | WST |
| Bao and Zou [32] 2012   | 30/30 (21/9)/30 (22/8) | RCT/no blind | FNCOCD-1997 | A + WM | WM | 68.40 ± 7.66/68.77 ± 6.06 | 48.80 ± 23.57/50.03 ± 24.33 | SSA + NIHSS + Barthel |
| Fan et al. [33] 2015    | 30/30 (13/17)/30 (14/16) | RCT/no blind | FNCOCD-1996 | A + WM | WM | 67.76 ± 4.34/68.03 ± 4.05 | 46.37 ± 25.34/47.18 ± 26.15 | SSA + WST + Smith et al. 1994 |
| Feng et al. [34] 2016   | 30/30 (18/12)/30 (19/11) | RCT/no blind | GFDTAISC-2010 | A + RT + BT | BT + RT | 60 ± 12/58 ± 22 | 38 ± 18/39 ± 18 | SSA + TIFRS |
| Zhen et al. [35] 2012   | 30/30 (16/14)/30 (13/17) | RCT/no blind | FNCOCD-1996 | A + BT | BT | 61 ± 3/60 ± 3 | 7 d-10 m/6 d-10 m | SSA |
| Chang et al. [36] 2014  | 38/38 (27/11)/38 (28/23) | RCT/no blind | FNCOCD-1996 | A + ES + BT | ES + BT | 46 ± 10/44 ± 11 | 16.6 ± 4.8/17.3 ± 5.2 | SSA + WST + Smith et al. 1994 |
| Wu et al. [37] 2014     | 80/80 (54/26)/75 (52/23) | RCT/no blind | TEESTCMDFS-1996 | A + BT + ST | BT + ST | 68/66 | NR | WST |

Table 2: The basic characteristic of the included studies.
| Reference          | Simple size T/C (M/F) | Design/blind          | Diagnostic criteria | Intervention     | Control       | Mean age (T/C) | Treatment course | Outcome measures                  |
|-------------------|----------------------|-----------------------|---------------------|------------------|---------------|----------------|------------------|-----------------------------------|
| Zhang and Yin [38] 2012 | 62 (32/30)/56 (22/34) | RCT/no blind          | RFNCOCD-1995        | A + BT + ST     | BT + ST       | 70 ± 2/68 ± 2  | 30.86 ± 12.72/31.78 ± 11.23 | MBSAS + WST + DRS                 |
| Chen [39] 2008     | 30 (19/11)/30 (17/13) RCT/no blind | TEETSTCMDFS-1997 | A + BT              | BT               | 42–79/40–81  | NR             | WST              |                                   |
| Mao et al. [40] 2015 | 40 (22/8)/40 (21/9) | RCT/no blind          | RFNCOCD-1995        | A + RT + BT     | RT + BT + SDTA| 63.64/62.9  | 56.2 ± 7.23/54.8 ± 6.033 | VFSS                             |
| Guo and Li [41] 2016 | 40 (23/7)/40 (25/15) | RCT/no blind          | FNCOCD-1997         | A + BT           | BT + ST       | 55.28 ± 10.34/56.12 ± 11.47 | 21.19 ± 8.28/20.49 ± 9.15 | SAA                             |
| Gao et al. [42] 2016 | 40 (24/6)/40 (23/8) | RCT/no blind          | FNCOCD-1994         | A + ST           | ST            | 578 ± 4.9±59.2 ± 5.1  | NR                | WST                             |
| Bai [43] 2016      | 40 (16/24)/40 (15/25) | RCT/no blind          | FNCOCD-1994         | A + SDTA        | SDTA          | 63.34 ± 9.04/63.15 ± 9.24 | NR                | WST                             |
| Chen [44] 2012     | 30 (19/11)/30 (20/10) | RCT/no blind          | CDGPATGBNBCMAG-2005 | A + ST + BT     | ST + BT       | 61.3/61.52  | 52.6 ± 1.3/52.6 ± 1.3  | VFSS + Rosenbek                   |
| Zhou et al. [45] 2015 | 30 (20/10)/30 (21/9) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | RT            | 65.63 ± 9.33/64.35 ± 8.26 | NR                | WST                             |
| Liu [46] 2014      | 45 (28/7)/42 (27/15) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | ST            | 52.3 ± 8.7±53.6 ± 8.5  | NR                | WST                             |
| Li et al. [47] 2013 | 30 (18/12)/30 (16/4) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT            | 56.9 ± 4.6±57.1 ± 3.7  | NR                | WST                             |
| Wang [48] 2011     | 30 (19/11)/30 (21/9) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT            | 61.7 ± 99.8 | 6–35 d7–34 d  | WST                             |
| Liu and Zheng [49] 2014 | 33 (17/6)/31 (14/7) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT            | 61.7 ± 99.8 | 6–35 d7–34 d  | WST                             |
| Gu [50] 2011       | 35 (22/13)/35 (23/12) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT            | 61.7 ± 99.8 | 6–35 d7–34 d  | WST                             |
| Gao et al. [51] 2014 | 52 (31/21)/49 (27/22) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | RT + SDTA    | 60.25 ± 8.36/61.37 ± 7.36 | NR                | WST                             |
| Chen [52] 2016     | 40 (24/6)/40 (23/8) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | RT + ST      | 62.90 ± 10.04/63 ± 9.83 | NR                | WST                             |
| Ruan et al. [53] 2015 | 25 (12/13)/25 (14/11) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | RT + ST      | 58.01 ± 10.74/57.98 ± 11.82 | 4702 ± 7.47/46.87 ± 6.96 | WST                             |
| Qu [54] 2015       | 46 (35/11)/45 (31/4) RCT/no blind | CDGPATGBNBICMA-2005 | A               | RT + BT        | RT + BT      | 61 ± 10/64 ± 10 | 54.63 ± 27/8.51.93 ± 23.10 | WST + SSA + SWAL-QOL + HAMD + MBI |
| Zhang et al. [55] 2016 | 65 (47/18)/65 (49/16) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT           | 63.87 ± 5.24/63.96 ± 5.33 | 2.32 ± 1.79/3.38 ± 1.90 | WST + IFRS                      |
| Guo and Zhu [56] 2015 | 30 (30/30)          | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | ST           | 69.06 ± 6.67/66.84 ± 10.39 | 27.23 ± 13.76/27.30 ± 8.11 | WST                             |
| Qu [57] 2009       | 30 (17/3)/30 (18/2) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT           | 45–75       | 5–45 d      | WST                             |
| Chen and Lin [58] 2016 | 60 (38/22)/60 (41/19) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | RT           | 65/63      | 9–40 d/10–38 d | WST                             |
| Gao et al. [59] 2015 | 50 (30/30)          | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT           | 45–75       | 5–45 d      | WST                             |
| Gao et al. [60] 2014 | 36 (22/4)/36 (25/1) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | BT           | 57.6 ± 8.2/58.5 ± 8.7  | 35.4 ± 6.5/34.8 ± 7.1  | WST                             |
| Zhang [61] 2014    | 50 (20/22)/46 (26/20) | RCT/no blind          | CDGPATGBNBICMA-2005 | A               | RT           | 63/62      | 35/36       | WST                             |
| Reference                | Simple size T/C/M/F | Design/blind       | Diagnostic criteria  | Intervention | Control | Mean age (T/C) | Treatment course | Outcome measures |
|--------------------------|---------------------|--------------------|----------------------|--------------|---------|----------------|------------------|------------------|
| Li et al. [63] 2014      | 20 (11/9)/20 (12/8) | RCT/no blind       | FNCOCD-1995          | A + BT + ST + BT + ST | 60.4 ± 4.6/61.3 ± 4.2 | 15.3 ± 2.7/14.7 ± 2.1 | WST + OFS        |
| Wang and Yang [64] 2013  | 45 (20/25)/45 (2/4) | RCT/no blind       | FNCOCD-1995          | A + ST + ST + BT | 61.33 ± 4.19/61.61 ± 5.34 | 29.12 ± 7.09/31.41 ± 6.32 | WST              |
| Ding and Zhang [65] 2013 | 30 (17/13)/30 (19/11) | RCT/no blind      | FNCOCD-1994          | A + BT | 63.14 ± 7.28/62.47 ± 6.98 | 272 ± 75/28.6 ± 7.9 | WST              |
| Fang [66] 2014           | 30 (16/4)/30 (15/5) | RCT/no blind       | FNCOCD-1996          | A + BT + CMPPS + BT + ST | 52.8 ± 6.9/53.9 ± 6.0 | 34.1 ± 15.3/31.4 ± 12.6 | WST              |
| Qin [67] 2013            | 30 (26/4)/30 (21/9) | RCT/no blind       | RNCOCD-1995          | A + BT | 61.42 ± 13.65/63.86 ± 10.83 | 34.99 ± 8.75/31.38 ± 7.21 | WST + SSA + ADL  |
| S. Zhang and G. M. Zhang [68] 2014 | 87 (64/23)/87 (5/29) | RCT/no blind       | CCNPATGBNBCMA-2007   | A + RT | 63.86 ± 10.55/64.61 ± 9.70 | 28.45 ± 23.42/31.48 ± 27.80 | WST + IFRS       |
| Zhu and Zhao [69] 2015   | 30 (18/12)/30 (16/4) | RCT/no blind       | TEETSTCMDFS-1996     | A + BT | 53.60 ± 12.96/56.10 ± 10.81 | 6.83 ± 16.07/0.05 ± 1.33 | WST              |
| Fu [70] 2016             | 110 (67/43)/110 (62/48) | RCT/no blind     | FNCOCD-2007          | A + RT + BT | 52.8 ± 10.4/55.4 ± 13.8 | 6.8 ± 2.3/8.5 ± 3.1 | WST              |
| Zhang et al. [71] 2007   | 50 (3/46)/50 (56/44) | RCT/no blind       | FNCOCD-1995          | A + RT | 53.16 ± 6.84/51.37 ± 8.63 | 45.8 ± 10.17/62.51 ± 10.17 | SSA + SWAL-QOL   |
| Wei and An [72] 2012     | 57 (32/25/56/30)    | RCT/no blind       | RNCOCD-1995          | A + BT + RT | 57/57 | 3/45/4/46 | WST              |
| Yi [73] 2013             | 28 (16/12)/28 (13/15) | RCT/no blind       | FNCOCD-1995          | A + RT | 38 ± 75/38/73 | 15 ± 6 m/18/15 m | WST              |
| Chen et al. [75] 2011    | 32 (12/26/28)       | RCT/no blind       | FNCOCD-1995          | A + RT | 57.71 ± 9.17/59.50 ± 8.79 | 50.21 ± 21.39/49.14 ± 20.76 | WST              |
| Wang and Cui [76] 2011   | 70 (49/12)/70 (52/18) | RCT/no blind       | FNCOCD-1996          | A + LFTP + BT | 66.12/64.87 | 65.4/711 | WST              |
| Li [77] 2016             | 30 (23/13)/36 (24/12) | RCT/no blind      | FNCOCD-1997          | A + BT + AM | 52.98 ± 4.93/53.61 ± 4.81 | 13.65 ± 5.25/12.33 ± 6.16 | WST              |
| Yu [78] 2014             | 30 (19/11)/30 (18/12) | RCT/no blind      | CCNPATGBNBCMA-2010   | A + SUMM | 62.03 ± 10.16/63.90 ± 8.64 | 66.23 ± 47.94/70.23 ± 44.36 | SSA + ADL        |
| Jia et al. [79] 2014     | 30 (23/7)/30 (21/9) | RCT/no blind       | FNCOCD-1995          | A + ST + NEST | 58.30 ± 7.8/56.47 ± 8.43 | <6 M | WST              |
| Huang et al. [80] 2013   | 30 (17/13)/30 (16/4) | RCT/no blind       | FNCOCD-1995          | A + ST + NEST | 65 ± 3/67 ± 2 | 109 ± 4/108/9 | WST              |
| Feng and Sun [81] 2016   | 30/30               | RCT/no blind       | FNCOCD-1996          | A + BT | NR | NR | WST              |
| Chen et al. [82] 2015    | 30/30               | RCT/no blind       | FNCOCD-1995          | A + BT + ST | BT + ST | NR | NR | IFRS             |
| Feng et al. [83] 2015    | 45 (32/13)/45 (29/16) | RCT/no blind       | FNCOCD-1995          | A + BT + ST + BT | 63.12/52.36 | 56.52/45.12 | WST              |
| Yu and Hu [84] 2012      | 40 (25/17)/38 (20/18) | RCT/no blind       | FNCOCD-1995          | A + BT + LFES | 62.51 ± 10.17/62.51 ± 10.17 | 13.78 ± 26.4/16.34 ± 2.48 | WST              |
| Zhao and Zhang [85] 2012 | 94 (48/46)/92 (47/45) | RCT/no blind       | FNCOCD-1995          | A + STA | 59.78/60.03 | NR | WST              |
| Yu et al. [86] 2012      | 30 (19/11)/30 (13/7) | RCT/no blind       | FNCOCD-1995          | A + ST | 54.30 ± 11.5/55.50 ± 10.7 | 30.25 ± 10.53/31.12 ± 8.92 | WST              |
| Zhang [87] 2014          | 30 (21/9)/30 (23/7) | RCT/no blind       | FNCOCD-1994          | A + ST | 68.3 ± 13.8/70.26 ± 11.97 | 43.37 ± 24.37/44.30 ± 22.52 | CTR7 + SSA + ADL |

(1) Diagnosis: FNCOCD, the diagnostic criterion of the Fourth National Conference on cerebrovascular diseases in 1994 or the revised diagnostic criterion in 1995 or 1996; FNCOCD the revised diagnostic criterion in 1995 or 1996; CCNPATGBNBCMA, the "Chinese Cerebrovascular Disease Prevention And Treatment Guidelines (Try Out)" established by Neurology Branch of Chinese Medical Association according to the 2005 or 2007 Disease Control Division; GFDTAISC2010, the guidelines for diagnosis and treatment of acute ischemic stroke in China 2010 Edition; NIHSS, National Institutes of Health Stroke Scale; TEESTCMDFS, the therapeutic effect evaluation standard of TCM diagnosis for stroke; SOSNCOCD, summary of the Sixth National Conference on cerebrovascular diseases. (2) Measures: CTR7, Caiteng 7 Rank; MBSAT, medical bedade swallowing assessment scale; DRS, dysphagia rank scale; WST, Watian Swallowing Test; SSA, standard swallowing assessment; VFISS, videofluoroscopy; IFRS, Ichiro Fujishima Rating Scale; ADL, Activity of Daily Life; WALQOL, Swallowing-Related Quality of Life; DDS, dysphagia severity scale; OFS, oral function score. (3) Intervention: SM, swallowing mixture; A, acupuncture; RT, rehabilitation; BT, basic treatment; SUMM, stroke unit management model; ST, swallowing treatment; SUG, stroke unit group; ES, electrical stimulation; TCM, traditional Chinese medicine; WM, Western medicine; OPT, oral positioning therapy; AM, acupoint massage; NES, neuromuscular electrical stimulation; MS, muscle electrical stimulation; LPT, low frequency pulse electrotherapy; ES, electrical stimulation; SDTA, swallowing disorder therapeutic apparatus; CMPPS, cold medicine Popsicle pharyngeal stimulation; IS, ice stimulation; NR, no report.
| Study or subgroup | Experimental Events | Control Events | Weight | Risk ratio | Risk ratio |
|------------------|---------------------|----------------|--------|------------|------------|
|                  | Total               | Total          |        |            |            |
| Wei and An 2012  | 46                  | 50             | 2.1    | 1.15       | [0.98, 1.35] |
| Li 2016          | 33                  | 36             | 1.8    | 1.14       | [0.94, 1.37] |
| Zhu and Zhao 2015| 25                  | 30             | 0.8    | 1.39       | [1.00, 1.94] |
| Li et al. 2013   | 29                  | 30             | 2.2    | 1.12       | [0.95, 1.30] |
| Li and Bai 2015  | 27                  | 32             | 0.9    | 1.33       | [0.98, 1.82] |
| Song 2012        | 26                  | 30             | 1.0    | 1.30       | [0.97, 1.74] |
| Chen et al. 2014 | 159                 | 168            | 3.4    | 1.05       | [0.99, 1.12] |
| Fan et al. 2007  | 26                  | 30             | 0.0    | 2.89       | [1.64, 5.08] |
| Liu 2014         | 30                  | 34             | 1.2    | 1.30       | [1.00, 1.70] |
| Ruan et al. 2015 | 24                  | 25             | 1.8    | 1.14       | [0.95, 1.38] |
| Liu 2014         | 42                  | 45             | 1.8    | 1.23       | [1.02, 1.48] |
| Yi 2014          | 26                  | 30             | 1.3    | 1.13       | [0.89, 1.44] |
| Liu et al. 2012  | 29                  | 36             | 0.8    | 1.53       | [1.08, 2.16] |
| Bai 2016         | 40                  | 40             | 2.6    | 1.14       | [1.01, 1.29] |
| Chen 2016        | 29                  | 30             | 2.2    | 1.12       | [0.95, 1.30] |
| Li et al. 2009   | 24                  | 30             | 0.8    | 1.33       | [0.95, 1.88] |
| Zhang et al. 2011| 20                  | 30             | 0.4    | 1.67       | [1.00, 2.76] |
| Gu 2011          | 34                  | 35             | 2.9    | 1.03       | [0.93, 1.14] |
| Chang et al. 2014| 38                  | 38             | 3.5    | 1.00       | [0.95, 1.05] |
| Chen and Zhang 2016| 30               | 30             | 3.0    | 1.03       | [0.94, 1.13] |
| Jia et al. 2014  | 29                  | 30             | 1.6    | 1.26       | [1.02, 1.55] |
| Yin 2013         | 49                  | 57             | 1.7    | 1.23       | [1.01, 1.51] |
| Huang 2011       | 27                  | 28             | 1.3    | 1.35       | [1.06, 1.72] |
| Chen et al. 2011 | 23                  | 28             | 0.7    | 1.44       | [1.00, 2.07] |
| Wang and Cui 2011| 63                  | 70             | 1.7    | 1.43       | [1.18, 1.74] |
| Li et al. 2015   | 60                  | 65             | 2.1    | 1.25       | [1.06, 1.47] |
| Gao et al. 2014  | 48                  | 52             | 2.6    | 1.03       | [0.91, 1.16] |
| Wu et al. 2011   | 67                  | 75             | 1.9    | 1.34       | [1.12, 1.60] |
| Liu 2014         | 31                  | 33             | 1.3    | 1.32       | [1.04, 1.68] |
| Wang 2016        | 28                  | 32             | 1.3    | 1.19       | [0.93, 1.54] |
| Wang 2015        | 43                  | 46             | 2.0    | 1.17       | [0.99, 1.38] |
| Fu 2016          | 47                  | 53             | 1.6    | 1.29       | [1.04, 1.60] |
| Zhang and Yin 2012| 60               | 62             | 2.3    | 1.23       | [1.07, 1.42] |
| Zhang et al. 2014| 30                  | 31             | 1.4    | 1.34       | [1.06, 1.69] |
| Dong et al. 2014 | 27                  | 30             | 1.1    | 1.35       | [1.02, 1.79] |
| Gao et al. 2016  | 39                  | 40             | 2.9    | 1.05       | [0.95, 1.17] |
| Zhen et al. 2012 | 29                  | 30             | 1.8    | 1.21       | [1.00, 1.46] |
| Feng et al. 2016 | 26                  | 30             | 1.0    | 1.30       | [0.97, 1.74] |
| S. Zhang and G. M. Zhang 2014| 83            | 87             | 3.2    | 1.04       | [0.96, 1.12] |
| Yu et al. 2012   | 28                  | 30             | 1.5    | 1.22       | [0.98, 1.52] |
| Deng et al. 2015 | 42                  | 45             | 2.3    | 1.11       | [0.95, 1.28] |
| Feng and Sun 2016| 27                  | 29             | 1.3    | 1.29       | [1.01, 1.64] |
| Wu 2013          | 23                  | 30             | 0.8    | 1.21       | [0.86, 1.69] |
| Chen and Lin 2016| 55                  | 59             | 2.3    | 1.17       | [1.01, 1.35] |
| Huang et al. 2013| 27                  | 30             | 1.4    | 1.17       | [0.93, 1.48] |
| Wang 2011        | 28                  | 30             | 1.8    | 1.12       | [0.93, 1.35] |
| Duan 2014        | 37                  | 40             | 1.7    | 1.23       | [1.01, 1.51] |
| Bao and Zou 2015 | 25                  | 30             | 0.0    | 3.13       | [1.69, 5.78] |
| Wang and Yang 2013| 45                  | 45             | 2.8    | 1.12       | [1.01, 1.25] |
| Guo and Li 2016  | 36                  | 40             | 1.4    | 1.29       | [1.02, 1.61] |
| Qin 2015         | 29                  | 30             | 1.4    | 1.32       | [1.05, 1.65] |
| Xie et al. 2011  | 37                  | 65             | 0.0    | 1.85       | [1.21, 2.82] |
| Zhao and Zhang 2012| 90                | 94             | 2.9    | 1.16       | [1.05, 1.28] |
| Zhang 2014       | 44                  | 50             | 1.6    | 1.23       | [1.00, 1.51] |
| Fang 2014        | 29                  | 30             | 1.9    | 1.16       | [0.98, 1.38] |
| Yu and Hu 2011   | 34                  | 40             | 1.1    | 1.35       | [1.02, 1.77] |
| Yin et al. 2011  | 15                  | 18             | 0.9    | 1.11       | [0.80, 1.54] |
| Mao et al. 2015  | 38                  | 40             | 2.7    | 1.03       | [0.92, 1.15] |
| Zhu et al. 2012  | 72                  | 82             | 2.2    | 1.18       | [1.02, 1.37] |

**Figure 5:** The forest diagram of the clinical efficacy rate.
On the outcome indicator of the dysphagia, most of the studies used the Watian Swallowing Test, SSA, Fujishima Rating Scale, and so on. Only 5 studies [21, 38, 50, 72, 87] used the golden standard-videofluoroscopy (VFSFF) [91] as the assessment indicator. The Watian Swallowing Test was put forward by the Toshio Watian from Japan, which was used as preliminary screening for dysphagia. Meanwhile, it was dependent on the feeling of patients and susceptible to them, which made the inconsistencies with most results in clinical and laboratory inspection [92, 93]. However, it was classified clearly and simply to use.

So it was employed in many researches clinically [18, 21, 23]. Therefore, the choice of evaluation criteria needs to be more rigorous and scientific in the clinical trial design. In order to increase the reliability, high level evaluators should be chosen to evaluate the efficacy for dysphagia simultaneously.

However, there were several limitations of this review. Some research used the acupuncture combined with other interventions on the basic of the control group. And it was easily mixed with the effect of the acupuncture. Therefore, for experiment group, acupuncture alone or combined with

| Study or subgroup | Experimental Events | Total | Control Events | Total | Weight | Risk ratio M-H, random, 95% CI | Risk ratio M-H, random, 95% CI |
|-------------------|---------------------|-------|----------------|-------|--------|-----------------------------|-----------------------------|
| Liu 2014          | 30                  | 34    | 23             | 34    | 11.0%  | 1.30 [1.00, 1.70]            |                             |
| Zheng 2014        | 28                  | 30    | 23             | 30    | 11.8%  | 1.22 [0.98, 1.52]            |                             |
| Qu 2009           | 26                  | 30    | 22             | 30    | 11.1%  | 1.18 [0.91, 1.53]            |                             |
| Chen 2008         | 28                  | 30    | 18             | 30    | 10.2%  | 1.56 [1.14, 2.12]            |                             |
| Zhang et al. 2007 | 108                 | 110   | 106            | 110   | 14.0%  | 1.02 [0.97, 1.07]            |                             |
| Gao and Zhu 2015  | 30                  | 30    | 25             | 30    | 12.7%  | 1.20 [1.01, 1.42]            |                             |
| Xie et al. 2011   | 37                  | 65    | 20             | 65    | 8.2%   | 1.85 [1.21, 2.82]            |                             |
| Yin et al. 2011   | 15                  | 18    | 20             | 25    | 10.6%  | 1.04 [0.78, 1.38]            |                             |
| Zhou et al. 2014  | 25                  | 30    | 20             | 30    | 10.3%  | 1.25 [0.93, 1.69]            |                             |
| Total (95% CI)    | 377                 | 384   | 100.0%         |       |        | 1.25 [1.03, 1.50]            |                             |

Heterogeneity: $r^2 = 0.06; \chi^2 = 32.15, df = 8 (P < 0.00001); I^2 = 87$

Test for overall effect: $Z = 2.31 (P = 0.02)$

Figure 6: The forest diagram of SSA effective rate.

Figure 7: The forest diagram of WST effective rate.
Table 1: Summary of results for WST subgroup analysis.

| Study or subgroup | Experimental Mean | Control Mean | Weight | Weight difference IV, random, 95% CI | Subtotal (95% CI) |
|-------------------|------------------|-------------|--------|---------------------------------------|------------------|
|                   | Mean | SD | Total |         | Mean | SD | Total |         | Mean difference | Heterogeneity: not applicable |
| 2.2.1. 28 d WST   |      |    |       |        | 2    | 1  | 46   | 3    | 1  | 45   | 7.1% | -1.00 [-1.41, -0.59] |
|                   | Subtotal      | 2    | 1  | 46   | 3    | 1  | 45   | 7.1% | -1.00 [-1.41, -0.59] |
| Zhang and Yin 2012| 1.6  | 1.06 | 62  | 2.2  | 1.15 | 56  | 7.1% | -0.60 [-1.00, -0.20] |
| Duan et al. 2014  | 1.79 | 0.61 | 45  | 2.9  | 0.24 | 45  | 7.8% | -1.11 [-1.20, -0.92] |
| Qin 2015          | 8.49 | 1.52 | 30  | 6.13 | 1.94 | 30  | 5.0% | 2.36 [1.48, 3.24]   |
| Subtotal          | 182  | 27.9% | 176 |       |     |     |    | -0.39 [-0.97, 0.19] |
| Heterogeneity:    | 2 = 0 |       |     |       |     |     |    |       |
| 2.2.2. 20 d WST   | 1.58 | 0.25 | 45  | 2.73 | 0.22 | 45  | 8.00 | -1.15 [-1.25, -1.05] |
| Wang and Yang 2013| 1.79 | 0.61 | 45  | 2.9  | 0.24 | 45  | 7.8% | -1.11 [-1.30, -0.92] |
| Subtotal          | 182  | 27.9% | 176 |       |     |     |    |       |
| 2.2.3. 24 d WST   | 2.71 | 0.84 | 52  | 3.01 | 0.89 | 49  | 7.4% | -0.30 [-0.64, 0.04] |
| Subtotal          | 170  | 33.8% | 170 |       |     |     |    |       |
| 2.2.4. 4 w WST    | 1.56 | 0.82 | 30  | 2.06 | 0.87 | 30  | 7.0% | -0.50 [-0.93, -0.07] |
| Subtotal          | 170  | 33.8% | 170 |       |     |     |    |       |
| 2.2.5. 1 w WST    | 1.71 | 1.59 | 30  | 5.12 | 2.07 | 30  | 4.8% | -3.41 [-4.34, -2.48] |
| Subtotal          | 170  | 33.8% | 170 |       |     |     |    |       |
| 2.2.6. 60 d WST   | 1.85 | 1.04 | 87  | 2.08 | 0.96 | 87  | 7.5% | -0.23 [-0.53, 0.07] |
| Subtotal          | 87   | 100.0% | 87  |       |     |     |    |       |
| 2.2.7. 2 m WST    | 2.4  | 0.4  | 40  | 3.2  | 0.8  | 40  | 7.6% | -0.80 [-1.08, -0.52] |
| Subtotal          | 40   | 100.0% | 40  |       |     |     |    |       |
| 2.2.8. 3 w WST    | 3.78 | 1.88 | 30  | 5.14 | 2.08 | 30  | 4.5% | -1.36 [-2.36, -0.36] |
| Subtotal          | 30   | 100.0% | 30  |       |     |     |    |       |
| Total              | 637  | 100.0% | 627 |       |     |     |    | -0.79 [-1.11, -0.47] |
| Heterogeneity:     | 2 = 0 |       |     |       |     |     |    |       |

Figure 8: The forest diagram of WST subgroup analysis.
Figure 9: The funnel of WST subgroup analysis.

| Study or subgroup | Experimental Mean (SD) | Control Mean (SD) | Weight | Mean difference IV, random, 95% CI |
|-------------------|-----------------------|-------------------|--------|-----------------------------------|
| Chang et al. 2014 | 8.01 (1.25) 38         | 6.73 (1.36) 36    | 11.2%  | 1.28 [0.68, 1.88]                 |
| Gao et al. 2014   | 5.58 (1.25) 52         | 4.76 (1.12) 49    | 13.6%  | 0.82 [0.36, 1.28]                 |
| Chen et al. 2015  | 7.85 (0.7) 30          | 5.86 (0.72) 30    | 15.5%  | 1.99 [1.63, 2.35]                 |
| Zhang and Yin 2012| 6.73 (1.16) 62         | 5.25 (1.25) 56    | 14.1%  | 1.48 [1.04, 1.92]                 |
| Chen and Lin 2016 | 7.38 (1.35) 30         | 5.72 (1.06) 30    | 10.9%  | 1.66 [1.05, 2.27]                 |
| Qin 2015          | 7.38 (1.72) 30         | 5.74 (1.35) 30    | 8.5%   | 1.64 [0.86, 2.42]                 |
| Zhang 2014        | 7.13 (1.25) 50         | 5.97 (1.09) 46    | 13.5%  | 1.16 [0.69, 1.63]                 |
| Yu and Hu 2011    | 8.97 (1.04) 40         | 7.13 (1.25) 38    | 12.7%  | 1.84 [1.33, 2.35]                 |

Total (95% CI) 332 315 100.0% 1.48 [1.18, 1.79]

Heterogeneity: $r^2 = 0.12$; $\chi^2 = 20.08$, df = 7 ($P = 0.005$); $I^2 = 65$

Test for overall effect: Z = 9.59 ($P < 0.00001$)

Figure 10: The forest diagram of swallowing function.

the interventions of the control group might increase the reliability.

Some studies [94, 95] showed that acupuncture seemed to be safe in the subacute phase of ischemic stroke and cardiac arrhythmia. Others [96] indicated that the safety of acupuncture needs further evidence. And some researches [97, 98] show that the occurrence of the adverse events during acupuncture was closely related to the competency of the practitioners and the safety system of acupuncture. However, in the process of literature retrieval, we found that most of the literatures included in this paper paid too much attention to the validity of acupuncture and ignored the influence of adverse event during acupuncture. Therefore, we should consider the security issues in the research design. The unfinished trials caused by the security issues should be reported perfectly according to international standard [99] to ensure the data’s integrity.

5. Conclusion

In conclusion, acupuncture for dysphagia after stroke has therapeutic efficacy. And the acupuncture is safe and reliable within a certain range. More strict evaluation standard and high-quality RCT design are necessary for further exploration on the acupuncture for treatment of dysphagia after stroke.
| Study or subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | Mean difference | IV, random, 95% CI | Mean difference | IV, random, 95% CI |
|------------------|------------------|----|-------|--------------|----|-------|--------|----------------|----------------|----------------|----------------|
| Liu et al. 2012  | 2.96             | 0.55 | 36    | 3.24         | 0.57 | 36    | 22.5%  | -0.28 [-0.54, -0.02] |                |                |
| Bai 2016         | 1.8              | 0.84 | 40    | 2.75         | 1.06 | 40    | 19.1%  | -0.95 [-1.37, -0.53] |                |                |
| Jia et al. 2014  | 1.83             | 1.05 | 30    | 2.47         | 1.17 | 30    | 16.1%  | -0.64 [-1.20, -0.08] |                |                |
| Wang and Cui 2011| 2.2              | 0.35 | 70    | 3.25         | 0.53 | 70    | 24.2%  | -1.05 [-1.20, -0.90] |                |                |
| Ding and Zhang 2013| 2.26            | 0.87 | 30    | 2.85         | 0.96 | 30    | 18.2%  | -0.59 [-1.05, -0.13] |                |                |

**Figure 2:** The forest diagram of swallowing disorder integral.

| Study or subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | Mean difference | IV, fixed, 95% CI | Mean difference | IV, fixed, 95% CI |
|------------------|------------------|----|-------|--------------|----|-------|--------|----------------|----------------|----------------|----------------|
| Yi 2014          | 49.67            | 14.56 | 30    | 48           | 13.49 | 30    | 7.9%   | 1.67 [-5.43, 8.77] |                |                |
| Wang 2015        | 70.33            | 19.79 | 46    | 58.22        | 20.37 | 45    | 5.9%   | 12.11 [3.86, 20.36] |                |                |
| Qin 2015         | 64.69            | 10.64 | 30    | 58.44        | 11.91 | 30    | 12.3%  | 6.25 [0.54, 11.96] |                |                |
| Zhu et al. 2012  | 48.65            | 8.63  | 82    | 40.26        | 7.67  | 82    | 64.1%  | 8.39 [5.89, 10.89] |                |                |
| Zhou et al. 2014 | 90.16            | 14.71 | 30    | 85.33        | 10.16 | 30    | 9.8%   | 4.83 [-1.57, 11.23] |                |                |

**Figure 12:** The forest diagram of SWAL-QOL.

| Study or subgroup | Experimental Events | Control Events | Weight | Risk ratio M-H, fixed, 95% CI | Risk ratio M-H, fixed, 95% CI |
|------------------|---------------------|----------------|--------|-------------------------------|-------------------------------|
| Zheng 2014       | 28                  | 30             | 50.0%  | 1.22 [0.98, 1.52]             |                               |
| Wang 2011        | 28                  | 30             | 50.0%  | 1.22 [0.98, 1.52]             |                               |

**Figure 13:** The forest diagram of ADL.

| Study or subgroup | Experimental Events | Control Events | Weight | Risk ratio M-H, fixed, 95% CI | Risk ratio M-H, fixed, 95% CI |
|------------------|---------------------|----------------|--------|-------------------------------|-------------------------------|
| Total (95% CI)   | 60                  | 60             | 100.0% | 1.22 [1.04, 1.42]             |                               |
| Total events     | 56                  |                |        |                               |                               |

Heterogeneity: $r^2 = 0.00, df = 1 (P = 0.00); I^2 = 0%  
Test for overall effect: $Z = 2.49 (P = 0.01)$

**Figure 14:** The forest diagram of Caiteng 7 Rank.
### Table 1: Study or subgroup

| Study or subgroup | Experimental | Control | Weight | Mean difference IV, random, 95% CI | Mean difference IV, random, 95% CI |
|------------------|--------------|---------|--------|-----------------------------------|-----------------------------------|
|                  | Mean SD Total| Mean SD Total|         |                                   |                                   |
| Song 2012        | 8.53 1.8 30  | 7.93 1.62 30 | 52.4%  | 0.60 [−0.27, 1.47]                |                                   |
| Ruan et al. 2015 | 9.32 0.79 25 | 7.51 2.45 25 | 47.6%  | 1.81 [0.80, 2.82]                 |                                   |
| **Total (95% CI)** | **55** | **55** | **100.0%** | **1.18 [−0.01, 2.36]** |                                   |

Test for overall effect: $Z = 1.95$ ($P = 0.05$)

#### Figure 15: The forest diagram of IFRS.

### Table 2: Study or subgroup

| Study or subgroup | Experimental | Control | Weight | Odds ratio M-H, fixed, 95% CI | Odds ratio M-H, fixed, 95% CI |
|------------------|--------------|---------|--------|-------------------------------|-------------------------------|
|                  | Events Total | Events Total |         |                               |                               |
| Li and Bai 2015  | 27 32       | 19 30    | 12.6%  | 3.13 [0.93, 10.47]            |                               |
| Li et al. 2009   | 24 30       | 18 30    | 14.8%  | 2.67 [0.84, 8.46]             |                               |
| Wang 2016        | 28 32       | 22 30    | 11.7%  | 2.55 [0.68, 9.56]             |                               |
| Zhang et al. 2014| 30 31       | 21 29    | 2.9%   | 11.43 [1.33, 98.34]           |                               |
| **Subtotal (95% CI)** | **125** | **119** | **42.0%** | **3.37 [1.75, 6.51]** |                               |
| **Total events** | **109**     | **80**   |         |                               |                               |

Heterogeneity: $\chi^2 = 5.02$, $df = 3$ ($P = 0.22$); $I^2 = 59$

Test for overall effect: $Z = 3.62$ ($P = 0.0003$)

#### Figure 16: The forest diagram of single blind clinical efficacy rate.

### Abbreviations

- NIHSS: National Institutes of Health Stroke Scale
- CT: Computerized tomographic scanning
- MRI: Magnetic resonance imaging
- SCI: Science Citation Index
- CNKI: Chinese National Knowledge Infrastructure
- CSJID: Chinese Scientific Journals Database
- CBM: Chinese Biomedical Literature Database
- CT7R: Caiteng 7 Rank
- WST: Watian Swallowing Test
- VFSS: Videofluoroscopy
- ADL: Activity of Daily Life
- IFRS: Ichiro Fujishima Rating Scale
- WALQOL: Swallowing-Related Quality of Life

### Disclosure

Qiuping Ye is the first author. The funding agency was not involved in data collection, data analysis, data interpretation, or manuscript development.

### Conflicts of Interest

The authors have no conflicts of interest to disclose.
**Study or subgroup** | **Experimental** | **Control** | **Weight** | **Mean difference** | **Mean difference**
|----------------|----------------|-------------|------------|-------------------|-------------------|
| **Hang et al. 2014** | 18.95 | 15.87 | 39 | 23.79 | 2.6 | 39 | 65.1% | -4.84 [-5.79, -3.89] | -4.84 [-5.79, -3.89] |
| **Luo et al. 2015** | 21.7 | 3.1 | 33 | 23.45 | 3.25 | 29 | 0.0% | -1.75 [-3.34, 0.16] | -1.75 [-3.34, 0.16] |
| **Wang 2016** | 23.05 | 2.559 | 32 | 27.93 | 6.648 | 30 | 16.7% | -4.90 [-7.44, -2.36] | -4.90 [-7.44, -2.36] |
| **Xia et al. 2015** | 27.5 | 7.33 | 62 | 30.25 | 6.39 | 62 | 18.1% | -2.75 [-5.17, 0.33] | -2.75 [-5.17, 0.33] |

Total (95% CI) | 133 | 131 | 100.0% | -4.47 [-5.59, -3.36] |

Test for overall effect: $Z = 7.85$ ($P < 0.00001$)

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**Figure 17:** The forest diagram of single blind SSA.

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**References**

1. M. Arnold, K. Liesiérova, A. Broeg-Morvay et al., “Dysphagia in patients with brainstem stroke, incidence and outcome,” PLOS ONE, vol. 79, no. 2, pp. 170–175, 2000.

2. D. G. Smithard, P. A. O’Neill, C. Park et al., “Complications and outcome after acute stroke: does dysphagia matter?” Stroke, vol. 27, no. 7, pp. 1200–1204, 1996.

3. M. González-Fernández, L. Ottenstein, L. Atanelov, and A. B. Christian, “Dysphagia after stroke: an overview,” Current Physical Medicine and Rehabilitation Reports, vol. 1, no. 3, pp. 187–196, 2013.

4. H. Chang, Y. D. Kwon, and S. S. Yoon, “Use of acupuncture therapy as a supplement to conventional medical treatments for acute ischaemic stroke patients in an academic medical center in Korea,” Complementary Therapies in Medicine, vol. 19, no. 5, pp. 256–263, 2011.

5. Z. Li F, “Research progress on acupuncture for dysphagia after stroke,” Journal of Liaoning University of Traditional Chinese Medicine, vol. 17, no. 8, pp. 210–212, 2015.

6. J. He and Q. C. He, “The discussion of clinical acupuncture chosen rule and thorn moxibustion methods for acupuncture for dysphagia after stroke,” Chinese Journal of Rehabilitation Medicine, vol. 23, no. 6, pp. 550–551, 2008.

7. Z. W. Li, “The influence of acupuncture on the swallowing function of patients with apoplexy,” China’s Traditional Chinese Medicine Emergency, vol. 19, pp. 1609–01, 2010 (Croatian).

8. A. Raglio, A. Zaliani, P. Biaardi et al., “Active music therapy approach for stroke patients in the post-acute rehabilitation,” Neurological Sciences, vol. 38, no. 5, pp. 893–897, 2017.

9. A. E. Arch, D. C. Weissman, S. Coca, K. V. Nystrom, C. R. Wira, and J. L. Schindler, “Erratum: Missed ischemic stroke diagnosis in the emergency department by emergency medicine and neurology services,” Stroke, vol. 47, no. 3, pp. 668–673, 2016.

10. Q. Sachiko and Q. Sun, PracTical Technique for Rehabilitation of Feeding and Swallowing Disorders [M], vol. 43, Chinese medical science and Technology Press, Beijing, China, 2000.

11. J. B. Palmer, K. V. Kuhlemeier, D. C. Tippett, and C. Lynch, “A protocol for the videofluorographic swallowing study,” Dysphagia, vol. 8, no. 3, pp. 209–214, 1993.

12. C.-H. Zhang, J.-L. Bian, Z.-H. Meng et al., “Tongguan Liqiao acupuncture therapy improves dysphagia after brainstem stroke,” Neural Regeneration Research, vol. 11, no. 2, pp. 285–291, 2016.

13. Saito, “Eiichi the treatment of strategic about ingestion and dysphagia,” J n. C G on the Mission of Medical, vol. 41, no. 6, pp. 404–408, 2004.

14. B. Martin-Harris and B. Jones, “The videofluorographic swallowing study,” Physical Medicine and Rehabilitation Clinics of North America, vol. 19, no. 4, pp. 769–785, 2008.

15. C. Kuo, C. T. Allen, C. Huang, and C. Lee, “Murray secretion scale and fiberoptic endoscopic evaluation of swallowing in predicting aspiration in dysphagic patients,” European Archives of Oto-Rhino-Laryngology, vol. 274, no. 6, pp. 2513–2519, 2017.

16. P. Chung and J. Ishii, “Jas. Cerebrovascular handicap of acute stage,” Research of C, vol. 28, no. 5, pp. 415–421, 2000.

17. J. Luo, Z. L. Gu, and Z. H. Xu, “The effect observation of ‘Tiao Shen li Yan’ acupuncture for dysphagia after stroke,” Chinese Journal of Physical and rehabilitation, vol. 37, no. 12, pp. 940–942, 2015.

18. W. Xia, C. Zheng, S. Zhu, and Z. Tang, “Does the addition of specific acupuncture to standard swallowing training improve outcomes in patients with dysphagia after stroke? a randomized controlled trial,” A randomized controlled trial Clinical Rehabilitation, vol. 30, no. 3, pp. 237–246, 2015.

19. Y. Xie, H. Liu, W. Zhou et al., “Effect of acupuncture on dysphagia of convalescent stroke patients,” Chinese Journal of Integrated Traditional and Western Medicine, vol. 31, no. 6, pp. 736–740, 2011.

20. Z. L. Yin, Z. X. Meng, and Y. J. Xie, “Swallowing training combined acupuncture and electrical stimulation treatment on stroke recovery excessie dysphagia,” Chinese Journal of Physical and rehabilitation, vol. 33, no. 12, pp. 916–919, 2011.

21. R. Zhang, T. Li, and H. X. Chen, “Rev pharynx soup with acupuncture—rehabilitation treatment for dysphagia after ischemic stroke, a randomized controlled study,” Xinjiang Journal of Traditional Chinese Medicine, vol. 32, no. 5, pp. 09-10, 2014.

22. Q. L. Wang, Tongue Three-Needle Combined with Neuromuscular Electrical Stimulation Treat Dysphagia after Stroke A Clinical Research, Fujian University of Traditional Chinese Medicine, 2016.
[23] B. D. Li and J. Bai, "Clinical observation of 62 cases of post—cerebral hemorrhagic dysphagia treated with cortex—throat—tongue root sequence acupuncture therapy," *World Journal of Integrated Traditional and Western Medicine*, vol. 10, no. 6, pp. 812–815, 2015.

[24] C. F. Liu, *A study on the Effect of Acupuncture Combined with Rehabilitation for Stroke Patients with Swallowing Dysfunction in Acute Period*, Chengdu University of Traditional Chinese Medicine, 2014.

[25] F. Hang, X. Fu, and T. Wang, "The effect of oral placement therapy combined with acupuncture of specific points on dysphagia after stroke," *Chinese Journal of Rehabilitation Medicine*, vol. 29, no. 12, pp. 1129–1133, 2014.

[26] H. X. Li, G. R. Qiu, and D. P. Liu, "Clinical observation of acupuncture combined with rehabilitation training on dysphagia after stroke," *Journal of Shaanxi Acupuncture and Moxibustion*, vol. 28, no. 7, pp. 388–389, 2009.

[27] Z. Q. Zhu, G. G. Xu, and Y. L. Guo, "Effect of acupuncture combined with stroke unit model for dysphagia after stroke," *Medical Journal of the Chinese People Armed Forces*, vol. 02, no. 10, pp. 144–149, 2012.

[28] L. Chen and G. M. Zhang, "Efficacy observation acupuncture and comprehensive rehabilitation project for treatment of dysphagia after stroke," *Journal of Emergency in Traditional Chinese Medicine*, vol. 26, no. 6, pp. 812–815, 2015.

[29] Z. N. Mao, T. Y. He, and L. Y. Mao, "Clinical study on aspiration pneumonia caused by dysphagia after stroke in stroke patients with dysphagia and aspiration pneumonia," *Journal of Emergency in Traditional Chinese Medicine*, vol. 6, no. 6, pp. 649, 2008.

[30] B. J. Song, *Chinese Academy of Chinese medical science*, China Academy of Chinese Medical Science, 2012.

[31] X. Wang, "30 cases of scalp acupuncture combined with body acupuncture treatment of dysphagia after stroke," *Journal of Tongguanliqiao Acupuncture*, vol. 10, no. 12, pp. 31–32, 2015.

[32] S. Gao, H. Z. Huang, and S. F. Li, "Effect of swallowing function training combined with acupuncture on dysphagia after stroke," *Hainan Medical Journal*, vol. 27, no. 15, pp. 5231–5233, 2016.

[33] H. Bai, "Effect of swallowing therapy combined with acupuncture on dysphagia after stroke," *Chinese Journal of Geriatric Care*, vol. 14, no. 1, pp. 102–103, 2016.

[34] B. J. Song, *China Academy of Chinese medical science*, China Academy of Chinese Medical Science, 2012.

[35] Z. Zhou, Y. L. Zhang, and H. Yuan, "Clinical observation of 60 cases of oral and body acupuncture treatment for dysphagia after stroke," *Lishizhen Medicine and Materia Medica Research*, vol. 24, no. 9, pp. 2160–2162, 2014.

[36] C. Liu, "The curative effect of acupuncture combined with swallowing training on pharyngeal phase of dysphagia after stroke," *Chinese Journal of Medical Rehabilitation*, vol. 33, no. 1, pp. 31–32, 2013.

[37] X. Wang, "30 cases of scalp acupuncture combined with body acupuncture treatment of dysphagia after stroke," *China's Naturopathy*, vol. 19, no. 5, pp. 14–15, 2011.

[38] Q. L. Li and H. D. Zheng, "Clinical observation standard on Tongue three needles of Jinjin and Yuye point for treatment of dysphagia after stroke," *Clinical Observation of the Effect of Three Needles in The Treatment of Dysphagia after Stroke*, Gongzhou University of Chinese Medicine, 2011.

[39] N. Gao, H. P. Ma, and X. Z. Zhang, "Clinical observation of treatment of dysphagia after stroke by Tongue acupuncture and Swallowing therapy instrument," *Journal of Emergency in Traditional Chinese Medicine*, vol. 23, no. 2, pp. 265–267, 2014.

[40] H. H. Chen, "The Observation of Curative Effect of Tongue Acupuncture for Treatment of Dysphagia after Stroke," Zhejiang University of Chinese Medicine, 2016.

[41] C. L. Ruan, C. J. Zhuang, and Z. Q. Huang, "25 cases of dysphagia after stroke treated by Tongguanliqiao acupuncture," *Fujian Journal of Traditional Chinese Medicine*, vol. 41, no. 1, pp. 31–32, 2015.
Y.H. Wang and H.Y. Yang, “The clinical observation of Tongnaohuoluo acupuncture combined with swallowing training for treatment of dysphagia after stroke,” Journal of Liaoning University of Traditional Chinese Medicine, vol. 13, no. 12, pp. 188–191, 2011.

F. Qu, “The curative effect observation of Jin Three-needle combined with rehabilitation training for treatment of dysphagia after stroke,” Guangzhou University of Chinese Medicine, 2009.

Z. Fang, “The effect of acupuncture combined with Chinese medicinal treatment for dysphagia after stroke in 59 cases,” Jiangxi Journal of Traditional Chinese Medicine, vol. 8, no. 47, pp. 71–73, 2016.

X. M. Chen and H. J. Lin, “Xingnaokaiqiao acupuncture therapy for dysphagia after stroke,” Journal of Acupuncture and Tuina Science, vol. 10, no. 1, pp. 44–48, 2012.

S. Dong, H. B. Lv, and J. Q. Liu, “Clinical observation of acupuncture combined with swallowing function training on dysphagia (pharyngeal phase) after stroke,” Chinese Journal of traditional Chinese Medicine, vol. 42, no. 2, pp. 129–131, 2014.

Y. Zhang, “Effect of acupuncture combined with neuromuscular electrical stimulation on dysphagia after cerebral infarction,” Journal of Sichuan of Traditional Chinese Medicine, vol. 32, no. 10, pp. 168–170, 2014.

S. Li, J. S. E, and Y. Qin, “The effect of acupuncture combined with buccal muscle electrical stimulation on oral phase of dysphagia after stroke,” Chinese Journal of Rehabilitation Theory and Practice, vol. 20, no. 3, pp. 221–223, 2014.

Y. H. Wang and H. Y. Yang, “Study on the clinical curative effect of acupuncture on choke point combined with Kaiqiao liyan stick and swallowing function training for dysphagia after stroke,” Clinical Journal of Chinese Medicine, vol. 5, no. 9, pp. 41–43, 2013.

D. Dong and S. Zhang, “Effect of nape acupuncture on swallowing function and TCD in patients with pseudobulbar palsy after ischemic stroke,” Medicine Information, vol. 26, no. 5, 2013.

Z. Fang, “The effect of acupuncture combined with Chinese medicine ice stimulation on swallowing function of patients with dysphagia after stroke,” Journal of Traditional Chinese Medicine, vol. 55, no. 11, pp. 931–934, 2014.

Y. Qin, “Clinical study on acupuncture of eight extra-meridians based treatment of dysphagia after stroke,” Yunnan University of Traditional, 2015.

S. Zhang and G. M. Zhang, “Treatment of 87 cases of dysphagia after stroke by acupuncture combined with swallowing rehabilitation training,” Anhui University of Chinese Medicine, vol. 33, no. 5, pp. 56–59, 2014.

B. B. Zhu and C. Y. Zhao, “Randomized parallel controlled study of acupuncture combined with swallowing training in the treatment of dysphagia after stroke,” Journal of Practical Traditional Chinese Medicine, vol. 29, no. 11, pp. 152–153, 2001.

R. T. Fu, “Treatment of 53 cases of dysphagia after stroke by acupuncture combined with routine treatment of cerebrovascular disease and rehabilitation therapy,” Traditional Chinese Medicinal Research, vol. 29, no. 2, pp. 56–58, 2016.

W. M. Zhang, P. Zheng, and W. Q. Zhang, “Standardization of acupuncture combined with rehabilitation training in the treatment of dysphagia after stroke,” World Journal of Integrated Traditional and Western Medicine, vol. 2, no. 11, pp. 659–661, 2007.

A. X. Wei and Y. L. An, “Clinical observation on 50 cases of dysphagia after stroke treated by acupuncture combined with swallowing function training,” World Journal of Integrated Traditional and Western Medicine, vol. 7, no. 5, 2012.

L. L. Yin, “Clinical study on acupuncture combined with rehabilitation therapy for 57 cases of dysphagia after stroke,” Journal of Traditional Chinese Medicine, vol. 54, no. 9, pp. 766–768, 2013.

L. P. Huang, L. L. Sun, and X. X. Zhang, “Clinical observation of acupuncture combined with rehabilitation training on dysphagia after stroke,” Shaanxi Journal of Traditional Chinese Medicine, vol. 32, no. 3, pp. 329–330, 2011.

L. R. Chen, Q. Lin, and L. Lin, “Therapeutic effect of acupuncture combined with neuromuscular electrical stimulation on dysphagia after stroke: a report of 28 cases,” Journal of Fujian University of TCM, vol. 21, no. 6, pp. 54–55, 2011.

L. Wang and Y. Cui, “Clinical observation on 70 cases of dysphagia after stroke treated by acupuncture combined with pulse electrotherapy,” Journal of Traditional Chinese Medicine, vol. 52, no. 24, pp. 2112–2114, 2011.

A. Y. Li, “The curative effect observation of Quan point acupuncture combined with acupoint massage for treatment of dysphagia after stroke which was complicated by pulmonary infection,” Journal of Emergency in Traditional Chinese Medicine, vol. 25, no. 9, pp. 1783–1785, 2016.

C. X. Yi, “The clinical efficacy observation of Rendu meridian acupoints combined with the stroke unit for treatment of dysphagia after stroke,” Hunan University of Chinese Medicine, 2014.

L. Jia, D. Liu, and J. Bai, “Effect analysis of four-choke acupuncture combined with rehabilitation therapy for dysphagia after stroke,” Contemporary Medicine, vol. 20, no. 36, pp. 1–2, 2014.

X. S. Huang, Q. Tian, and R. Y. Mo, “A randomized parallel controlled study of acupuncture for treatment of moderate to severe dysphagia in stroke patients,” Journal of Practical Traditional Chinese Internal Medicine, vol. 27, no. 2, pp. 143–144, 2013.

X. E. Feng and L. Sun, “Observation on therapeutic effect of acupuncture on dysphagia after stroke: a report of 30 cases,” China Health Standard Management, vol. 7, pp. 149–151, 2016.

Q. Chen, W. G. Xia, and B. G. Chen, “Clinical study on acupuncture treatment of dysphagia caused by pseudobulbar palsy after stroke,” Nei Mongol Journal of Traditional Chinese Medicine, vol. 05, no. 11, pp. 118–119, 2015.

W. X. Feng, P. Li, and Y. M. Min, “Acupuncture treatment of dysphagia after stroke: a report of 45 cases,” Shandong Journal of Traditional Chinese Medicine, vol. 36, no. 1, pp. 91–92, 2015.

Z. H. Yu and J. F. Hu, “78 Cases of Acupuncture Combined with Rehabilitation Training in The Treatment of Dysphagia after Stroke,” in Proceedings of The 2011 Annual Meeting of The Chinese Society for Acupuncture And Moxibustion, pp. 55–58, 2011.

Y. Z. Zhao and H. Zhang, “Observation on therapeutic effect of acupuncture combined with swallowing therapy on dysphagia after stroke,” Shaanxi Journal of Traditional Chinese Medicine, vol. 28, no. 5, pp. 29–30, 2012.

W. J. Yu, M. X. Zhang, and C. M. Sun, “Acupuncture for dysphagia after stroke: a report of 30 cases,” Journal of Clinical Acupuncture and Moxibustion, vol. 28, no. 12, pp. 21–23, 2012.
[87] D. Zheng, *Clinical Study of Scalp Acupuncture Combined with Rehabilitation Training for Treatment of Dysphagia after Stroke*, Gungzhou University of Chinese Medicine, 2014.

[88] L. P. Wang and Y. Xie, "Systematic evaluation on acupuncture for treatment of dysphagia after stroke," *Chinese Acupuncture*, vol. 26, no. 2, pp. 141–146, 2006.

[89] D. Meng, Y. B. Shang, Y. F. Fu et al., "Clinical literature study of acupuncture and moxibustion in the treatment of post-stroke dysphagia based on meta analysis," *Chinese Medicine Modern Distance Education of China*, vol. 16, no. 64, pp. 148–153, 2016.

[90] Y.-B. Long and X.-P. Wu, "A meta-analysis of the efficacy of acupuncture in treating dysphagia in patients with a stroke," *Acupuncture in Medicine*, vol. 30, no. 4, pp. 291–297, 2012.

[91] M. M. B. Costa, "Videofluoroscopy: The gold standard exam for studying swallowing and its dysfunction," *Arquivos de Gastroenterologia*, vol. 47, no. 4, pp. 327-328, 2010.

[92] J. Zhang, Y.-J. Wang, and T. Cui, "Reliability and validity of nine rating scales for dysphagia following stroke," *Chinese Journal of Clinical Rehabilitation*, vol. 8, no. 7, pp. 1201–1203, 2004.

[93] J. W. Wu, X. Bi, and L. Song, "Value of applying water swallowing test for patients with dysphagia after acute stroke," *Journal of Shanghai Jiao Tong University (Medical Science)*, vol. 36, no. 7, pp. 1049–1053, 2016.

[94] S. Zhang, B. Wu, M. Liu et al., "Acupuncture efficacy on ischemic stroke recovery: multicenter randomized controlled trial in China," *Stroke*, vol. 46, no. 5, pp. 1301–1306, 2015.

[95] J. Liu, S. N. Li, L. Liu et al., "Conventional acupuncture for cardiac arrhythmia: A systematic review of randomized controlled trials," *Chinese Journal of Integrative Medicine*, pp. 1–9, 2017.

[96] Y. Cai, C. S. Zhang, S. Liu et al., "Electro-acupuncture for post-stroke spasticity: a systematic review and meta-analysis," *Archives of Physical Medicine and Rehabilitation*, 2017.

[97] H. J. Lee, Y. Kim, and W. Y. Kim, "Safety concerns with thoracoabdominal acupuncture: experience at a tertiary-care emergency department," *Pain Medicine*, 2017.

[98] Q. Y. Li, Y. Y. Liu, J. Zhang et al., "Analysis of the adverse reactions of acupuncture and acupuncture accidents," *Chinese Acupuncture and Moxibustion*, vol. 8, no. 31, pp. 0255–0930, 2011.

[99] D. Moher, K. F. Schulz, D. G. Altman, and L. Lepage, “The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomized trials,” *Annals of Internal Medicine*, vol. 134, no. 8, pp. 657–662, 2001.