

Review article

Acupuncture for dysphagia following stroke: A systematic review

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Abstract

Background: This systematic review reports an update evaluation and critically appraise on available randomized controlled trials (RCTs) which investigated the effectiveness of acupuncture on dysphagia in stroke rehabilitation.

Methods: A literature search was performed to identify all RCTs that investigated the therapeutic effect of acupuncture on dysphagia after stroke from 1966 to 2011. The recruited studies were classified according to the types of participants, types of intervention, outcome measures and results. The corresponding methodological qualities of the recruited studies were also evaluated using Cochrane risk-of-bias criteria and the Physiotherapy Evidence Database (PEDro) scale.

Results: The current review was based on nine RCTs that showed a positive effect of acupuncture and conventional rehabilitation on dysphagia compared to conventional rehabilitation alone. All the studies reported short-term effect of acupuncture on dysphagia and no follow-up data were available.

Conclusions: The current review appeared to reveal that acupuncture together with conventional rehabilitation has positive effect on dysphagia after stroke. However, with the concerns in the methodology of the studies in this systematic review, a larger sample, multi-centre, well designed RCTs with homogeneity of outcome measures needs to be carried out before recommending acupuncture as a standard treatment to patients with dysphagia after stroke.

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Keywords: Acupuncture; Dysphagia; Stroke

Introduction

Stroke is one of the major leading causes of mortality and disability worldwide [1]. Dysphagia is a common condition after acute stroke. Studies have shown the occurrence of 30–50%

among this population [2,3]. Although the severity of dysphagia varies among individuals, it may be life threatening and affect the quality of life if not managed appropriately. Earlier studies have shown that it was closely associated with an increased risk in developing pulmonary complications such as aspiration pneumonia, malnutrition, length of hospital stay, and institutional care [2,4].

The management of dysphagia is crucial as it is a poor prognostic indicator and has a significant impact on hospital utilization and thus implication on resources allocation [5]. The goal of dysphagia management aims to ensure safety of oropharyngeal swallowing, adequate nutrition, hydration intake, and ultimately improvement in quality of life. Traditional treatment and management of dysphagia include dietary modification, compensatory feeding postures, modification of feeding environment, thermal tactile stimulation [6], exercises to strengthen the swallowing musculature, and transcutaneous neuromuscular stimulation [7]. However, a significant number of individuals with dysphagia may need transient or long-term non-oral feeding mode such as nasogastric feeding tube or percutaneous endoscopic gastrostomy as a consequence of stroke.

Abbreviations: APET, acupoint percutaneous electric stimulation; AT, acupuncture therapy; ATP, acupoint token puncturing; CAM, complementary and alternative medicine; COT, conventional therapy; therapy of neurologic internal medicine and feeding and swallowing rehabilitation training; CT, computerized tomography; EAT, electro-acupuncture; ES, electrical stimulation; FEES, fiberoptic endoscopic examination of swallowing; FSRT, feeding and swallowing rehabilitation training; MRI, magnetic resonance imaging; MBI, Modified Barthel Index; PEDro, Physiotherapy Evidence Database; TCM, Traditional Chinese Medicine; SSA, standardized swallowing assessment; RCTs, randomized controlled trials; RT, routine treatment; therapy of neurologic internal medicine; SWAL-QOL, swallowing related-quality of life; VFSS, video-fluoroscopic swallow study; WD, western drugs.

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Clinical observation suggests that many stroke survivors may quickly regain their swallowing abilities. Nevertheless, studies have shown that dysphagia symptoms persist at 6 months post onset [8,9]. Although clinicians utilize many dysphagia treatment and therapy in their daily clinical practice, there is still no well established evidence to support the use of any of the available treatment options [10]. This condition drives survivors to look for other therapies that will improve the outcomes of swallowing rehabilitation.

Acupuncture is a therapy that involves the stimulation of defined acupoints along the body's 14 meridian lines to regulate the flow of Qi (energy) using fine needles [11]. Acupuncture has been used in Traditional Chinese Medicine (TCM) for more than 3000 years as a treatment for many types of health problems such as pain and dysphasia [11]. The mechanisms of the effects of acupuncture remain poorly understood. It is however believed that acupuncture causes a variety of biological responses that occur at the site of stimulation and conduct Qi through its correct paths [12]. Its application in stroke rehabilitation is common in mainland China but also increasingly practiced in western countries as a form of complementary and alternative medicine (CAM). It has been used primarily for overall motor recovery of limbs but more attention has been put on the use of acupuncture in the treatment of dysphagia and attempt to further improve clinical outcomes.

The physiological effect of acupuncture for dysphagia post stroke has not been extensively studied. Previous studies have suggested that acupuncture might alter regional brain activities [13]. Moreover, acupuncture can help in restoration and reconstruction of swallowing function by establishing new synaptic connection and accelerating the restoration and reconstruction of swallowing reflex arc [14]. Given the potential biological effects of acupuncture as treatment of dysphagia post stroke, its application in the intervention of dysphagia has become popular in China and elsewhere in the world.

Recently, a number of clinical studies have been conducted in the application of acupuncture therapy for dysphagia after stroke. Previous systematic reviews [15,16] in this area however are limited and included studies only up to 2008. The objective of this systematic review was to conduct an updated review up to 2011 and critically appraise available RCTs which investigated the therapeutic effects of acupuncture on dysphagia in stroke rehabilitation.

Methods

Literature search

The literature search was performed with the use of MEDLINE, CINAHL, PubMed, Embase, Cochrane database and China Knowledge Resource Integrated Database. In addition, a hand search of Chinese Acupuncture and Moxibustion and Journal of Shanghai Acupuncture and Moxibustion were conducted by the reviewers which were not covered in the above electronic databases. The keywords used in the search were “acupuncture and stroke/cerebrovascular accident/cerebral infarction/intracerebral haemorrhage/cerebral embolism/CVA

and dysphagia/deglutition disorders”. All English and Chinese publications from 1966 to February 2011 were included in the literature search.

Study design and intervention

Only RCTs were recruited in this review. RCTs are defined as those experimental studies which included randomizing participants into groups of controlled comparison of intervention or/and placebo [17]. In the current review, we recruited all RCTs that compared any types of acupuncture including conventional, non-conventional or electric acupuncture with no acupuncture. The site of acupoints was not considered recruitment criteria for this review. We excluded those studies of acupuncture treatment without needling, for example, acupressure or laser acupuncture. Furthermore, we also excluded those studies that the eligibility criteria were not met according to the PEDro scale [18]; compared the effect of different needling; and were presented in the form of letters, dissertations, abstracts, and case reports.

Participants

We recruited studies that included the following characteristics for the participants. First, the participants were diagnosed clinically, computerized tomography (CT), or magnetic resonance imaging (MRI) according to the World Health Organization definition [19] to suffer from ischaemic or haemorrhagic stroke in acute, subacute stage, or chronic stage. Operationally acute stage of stroke recovery was defined as ≤ 1 month after stroke. Sub-acute stage of stroke recovery was defined as 1–6 months after stroke. Finally, chronic stage of stroke recovery was defined as more than 6 months after onset of stroke [20]. Second, participants were diagnosed by bedside swallowing assessment, videofluoroscopic swallowing study (VFSS), or fiberoptic endoscopic examination of swallowing (FEES) to suffer from dysphagia. We excluded those studies that included participants with dementia, poor cognitive functions, poor mental alertness, severe mental disorders, pulmonary infection, and poor physical condition that could not tolerate acupuncture.

Outcome measures

Outcome measures in the current review included bedside swallowing assessment/VFSS/FEES, aspiration pneumonia, quality of life, length of hospital stay, nutritional measure, and report of adverse effect.

Study quality assessment and data extraction

The two reviewers independently extracted studies according to the above mentioned inclusion and exclusion criteria. The quality of the methodology of the extracted studies was assessed by both Cochrane risk-of-bias tool [21] and PEDro scale [18]. The Cochrane risk-of-bias tool was used to assess the risk of bias of the included studies which consists of six domains: 1. sequence generation; 2. allocation concealment; 3.

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