Stroke is the third leading cause of death in Western society; in China it is the second most common cause of death in cities and the third in rural areas. It is also a main cause of adult disability and dependency. Despite considerable research efforts on multiple treatment modalities, there is still no single rehabilitation intervention demonstrated unequivocally to aid stroke recovery. This reality drives people to search for other modalities of treatment in an attempt to further improve the outcome of stroke rehabilitation, such as acupuncture.

Acupuncture can cause multiple biological responses, including circulatory and biochemical effects. These responses can occur locally or close to the site of application, or at a distance. They are mediated mainly by sensory neurons to many structures within the central nervous system. This can lead to activation of pathways affecting various physiological systems in the brain as well as in the periphery.1–4

Acupuncture has been well accepted by Chinese patients and is widely used to improve motor, sensation, speech, and other neurological functions in patients with stroke. As a therapeutic intervention, acupuncture is also increasingly practiced in some Western countries.2,5 However, it remains uncertain whether the existing evidence is scientifically rigorous enough so that acupuncture can be recommended for routine use.

Objectives
The objective was to assess the efficacy and safety of acupuncture for patients with stroke in the subacute or chronic stage.

Methods
We performed a sensitive electronic search of multiple reference databases in late 2005, including Cochrane Stroke Group Trials Registry, the Cochrane Complementary Medicine Field Trials Register, the Cochrane Central Register of Controlled Trials, MEDLINE(Ovid), EMBASE, CINAHL, AMED, the Chinese Biological Medicine Database, the National Center for Complementary and Alternative Medicine Register, and the National Institute of Health Clinical Trials Database. We included all randomized clinical trials among patients with ischemic or hemorrhagic stroke, in the subacute or chronic stage, which compared acupuncture involving needling with either placebo acupuncture, sham acupuncture, or no acupuncture. Two review authors independently selected trials for inclusion, assessed quality, extracted, and cross-checked the data.

Main Results
Five trials (368 patients) met the inclusion criteria. Methodological quality was considered inadequate in all trials. Although the overall estimate from 4 trials suggested the odds of improvement in global neurological deficit was higher in the acupuncture group compared with the control group (odds ratio [OR] 6.55, 95% confidence interval [CI] 1.89 to 22.76; see Figure), this estimate may not be reliable because there was substantial heterogeneity (I²=68%). One trial showed no significant improvement of motor function between the real acupuncture group and the sham acupuncture group (OR 9.00, 95% CI 0.40 to 203.30), but the confidence interval was wide and included clinically significant effects in both directions. No data on death, dependency, institutional care, change of neurological deficit score, quality of life, or adverse events were available.

Conclusions
Implications for Practice
This systematic review does not provide evidence to support the routine use of acupuncture for patients with subacute or chronic stroke.
Implications for Research
The widespread use of acupuncture, the promising results with less severe side effects, lower cost, and the insufficient quality of the available trials warrant further research. Large sham or placebo-controlled trials are needed to confirm or refute the available evidence.

Acknowledgments
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Disclosures
None.

References

Figure. Improvement of global neurological deficit at the end of treatment in stroke patients.

Table: Treatment of stroke patients with acupuncture

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Treatment n/N</th>
<th>Control n/N</th>
<th>OR (random) 95% CI</th>
<th>Weight % 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dai 1997</td>
<td>44/46</td>
<td>30/45</td>
<td>24.61</td>
<td>11.00 [2.34, 51.65]</td>
</tr>
<tr>
<td>Li 1997a</td>
<td>20/42</td>
<td>42/50</td>
<td>27.20</td>
<td>1.81 [0.50, 6.49]</td>
</tr>
<tr>
<td>Lun 1999</td>
<td>59/61</td>
<td>25/46</td>
<td>24.35</td>
<td>27.14 [5.94, 123.93]</td>
</tr>
<tr>
<td>Wang 2001</td>
<td>32/34</td>
<td>21/26</td>
<td>22.47</td>
<td>3.81 [0.65, 23.48]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>193</td>
<td>169</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total events: 173 (Treatment), 118 (Control)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Test for heterogeneity: Q(3) = 8.16, df = 3 (P = 0.04), I² = 83.3%</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Test for overall effect: Z = 2.96 (P = 0.003)</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Favour control</th>
<th>Favour treatment</th>
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</thead>
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<tr>
<td>0.1</td>
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<td>0.5</td>
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<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
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</table>

KEY WORDS: acupuncture stroke systematic review
Acupuncture for Stroke Rehabilitation
Hongmei Wu, Jinling Tang, Xiaoping Lin, Joseph Lau, Ping C. Leung, Jean Woo and Youping Li

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