

# Acupuncture for schizophrenia (Review)

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Acupuncture for schizophrenia (Review)

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[Intervention Review]

# Acupuncture for schizophrenia

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## ABSTRACT

### Background

Acupuncture has been shown to be a relatively safe health care intervention with few adverse effects. In contrast, antipsychotic drugs may have serious adverse effects. The benefits of acupuncture in the treatment of schizophrenia are unclear, and more evidence is needed to inform clinicians and people with schizophrenia of its effects.

### Objectives

To review the effects of acupuncture for people with schizophrenia and related psychoses; evaluating acupuncture alone and in combination regimes compared with antipsychotics alone.

### Search strategy

We (JR, JX) undertook electronic searches of the Cochrane Schizophrenia Group's register (April 2005), which is compiled from systematic searches of major databases, hand searches and conference proceedings. We inspected reference lists and contacted the first author of each included study.

### Selection criteria

We included all relevant randomised controlled trials involving people with schizophrenia-like illnesses, allocated to acupuncture, electro-acupuncture, laser-acupuncture, placebo, no treatment, or antipsychotic drugs produced by pharmaceutical companies.

### Data collection and analysis

We independently extracted the data. For homogeneous dichotomous data, the fixed effects relative risk (RR), the 95% confidence intervals (CI) and, where appropriate, the number needed to treat (NNT) were calculated on an intention-to-treat basis. For continuous data, we calculated weighted mean differences with 95% CI.

### Main results

We included five trials. Two trials comparing acupuncture to antipsychotics were equivocal for global state and leaving the study early. Extrapyramidal adverse events were significantly lower in the acupuncture group (n=21, RR 0.05 CI 0.0 to 0.8, NNT 2 CI 2 to 8). Four out of the five trials also compared acupuncture combined with antipsychotics to antipsychotics alone. Global state outcomes and leaving the study early were equivocal. BPRS endpoint data (short term) favoured the combined acupuncture and antipsychotic group

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(n=109, WMD -4.31 CI -7.0 to -1.6), although dichotomised BPRS data 'not improved' confounded this outcome with equivocal data. Depression scores HAMD (n=42, WMD -10.41 CI -12.8 to -8.0), HAMD 'not improved' (n=42, RR 0.17 CI 0.1 to 0.5, NNT 2 CI 2 to 3) and ZDS (n=42, WMD -24.25 CI -28.0 to -20.5) significantly favoured the combined acupuncture/antipsychotic treatment group, although results were from single, small studies. Treatment emergent adverse events scores were significantly lower in the acupuncture/antipsychotic group (n=40, WMD -0.50 CI -0.9 to -0.1), again from a single, small study.

### Authors' conclusions

We found insufficient evidence to recommend the use of acupuncture for people with schizophrenia. The numbers of participants and the blinding of acupuncture were both inadequate, and more comprehensive and better designed studies are needed to determine the effects of acupuncture for schizophrenia.

## PLAIN LANGUAGE SUMMARY

### Acupuncture for schizophrenia

Antipsychotic drugs have been used to treat schizophrenia since the early 1950s. While effective for some, antipsychotics can still leave many of those treated with disabling adverse effects, and safer, more effective health care interventions are being researched to try and redress this problem.

Acupuncture has been used in China to treat mental health disorders, including schizophrenia, for more than 2000 years. It has been proved that acupuncture has very few adverse effects. Also, it may be more socially acceptable, tolerable and inexpensive than the more conventional drugs manufactured by the pharmaceutical industry.

This review identifies randomised controlled trials comparing acupuncture to antipsychotics and acupuncture combined with antipsychotics, to antipsychotics alone. The limited data we found provided mostly equivocal outcomes. Although some of the data did favour acupuncture when combined with antipsychotics, the results came from small studies, and further, more comprehensive trials are needed before we can confidently determine the efficacy of acupuncture in the treatment of schizophrenia.

## BACKGROUND

Antipsychotic drugs have been the mainstay of treatment for schizophrenia since the early 1950s. While effective for some people with the illness, these treatments still leave many with disabling adverse effects. Acupuncture has been shown to have few adverse effects (MacPherson 2001a, Ernst 2001) and may be more socially acceptable, tolerable and inexpensive than the more conventional drugs available from the pharmaceutical industry.

Chinese medicine, which includes acupuncture and is also referred to as Traditional Chinese Medicine (TCM), has been used to treat 'schizophrenia like illnesses' (i.e. Dian Kuang/withdrawal mania) for over 2000 years (Ming 2001). Acupuncture is practiced as an accepted health care model in China, Korea and Japan, although the methods used in each country are distinct (Kaptchuk 2002). Acupuncture involves the stimulation of specific points (acupoints) by inserting needles into the skin. Its theories for the

aetiology, pathology and treatment of schizophrenia are different to those of Western medicine. Conventional medicine diagnoses schizophrenia primarily by operationalised criteria such as the Diagnostic and Statistical Manual (DSM-IV) or the International Classification of Diseases (ICD10) and their equivalents. Chinese medicine uses different methodology to diagnose mental health disorders such as schizophrenia by pattern differentiation. The four diagnostic methods (inspection, listening/smelling, inquiry and palpation) are the means to obtain patient information (Xu 1991). This information is then analysed using one or several diagnostic models (Zang Fu theory, Eight Principles [yin/yang, interior/exterior, excess/deficiency, hot/cold], Four Levels, Six Divisions, 5 phases, Qi and Blood, Fluids and humours, Three burners) to arrive at a diagnosis. Thus, two people diagnosed with DSM-IV schizophrenia could nevertheless, from a Chinese medicine perspective, have different sub-types or patterns and therefore require

different treatment. There are five main patterns which fall within the disease category of Dian Kuang/withdrawal mania which can also encompass schizophrenia. The five types are: 1. Phlegm-Fire; 2. Phlegm-damp; 3. Qi stagnation with Blood stasis; 4. Hyperactivity of Fire due to Yin deficiency; 5. Other miscellaneous types (Zhang 1996).

## OBJECTIVES

To review the effects of acupuncture for people with schizophrenia and related psychoses, evaluating acupuncture alone and in combination regimes compared with antipsychotics alone.

## METHODS

### Criteria for considering studies for this review

#### Types of studies

We included all relevant randomised controlled trials. Where a trial was described as 'double-blind' but it was implied that the study was randomised, these trials were included in a sensitivity analysis. If there was no substantive difference within primary outcomes (see 'Types of outcome measures') when these 'implied randomisation' studies were added, then they were included in the final analysis. If there was a substantive difference, only clearly randomised trials were utilized and the results of the sensitivity analysis described in the text. Quasi-randomised studies, such as those allocating by using alternate days of the week, were excluded.

#### Types of participants

We included patients with schizophrenia, schizophreniform psychosis and schizophrenia-like illnesses, any age, diagnosed by any criteria.

#### Types of interventions

1. Acupuncture/electro-acupuncture with or without moxibustion (a Traditional Chinese Medicine technique that involves the burning of mugwort to facilitate healing) or laser treatment, administered solely or in conjunction with antipsychotic drugs.
2. Placebo (sham acupuncture) or no treatment.
3. Antipsychotic drugs produced by pharmaceutical companies: any compound, dose, pattern or means of administration.

## Types of outcome measures

The following outcomes of interest were identified.

1. Death - suicide or natural causes.
2. Global state
  - 2.1 Relapse\*
  - 2.2 No clinically important change in global state - as defined by each of the studies
  - 2.3 Average endpoint global state score
  - 2.4 Average change in global state scores
3. Mental state
  - 3.1 No clinically important change in general mental state - as defined by each of the studies\*
  - 3.2 No change in general mental state
  - 3.3 Average endpoint general mental state score
  - 3.4 Average change in general mental state scores
  - 3.5 No clinically important change in specific symptoms - as defined by each of the studies
  - 3.6 No change in specific symptoms
  - 3.7 Average endpoint specific symptom score
  - 3.8 Average change in specific symptom scores
4. Behaviour
  - 4.1 Leaving the study early
  - 4.2 No clinically important change in general behaviour - as defined by each of the studies
  - 4.3 No change in general behaviour
  - 4.4 Average endpoint general behaviour score
  - 4.5 Average change in general behaviour scores
  - 4.6 No clinically important change in specific aspects of behaviour
  - 4.7 No change in specific aspects of behaviour
  - 4.8 Average endpoint specific aspects of behaviour
  - 4.9 Average change in specific aspects of behaviour
5. Service outcomes
  - 5.1 Hospitalisation\*
  - 5.2 Time to hospitalisation
6. Adverse effects
  - 6.1 Clinically important general adverse effects\*
  - 6.2 Any general adverse effects
  - 6.3 Average endpoint general adverse effect score
  - 6.4 Average change in general adverse effect scores
  - 6.5 No clinically important change in specific adverse effects - as defined by each of the studies
  - 6.6 No change in specific adverse effects
  - 6.7 Average endpoint specific adverse effects
  - 6.8 Average change in specific adverse effects
7. Engagement with services
  - 7.1 No clinically important engagement - as defined by each of the studies
  - 7.2 No engagement
  - 7.3 Average endpoint engagement score
  - 7.4 Average change in engagement scores
8. Satisfaction with treatment
  - 8.1 Recipient of care not satisfied with treatment

8.2 Recipient of care average satisfaction score  
 8.3 Recipient of care average change in satisfaction scores  
 9. Quality of life  
 9.1 No clinically important change in quality of life - as defined by each of the studies  
 9.2 No change in quality of life  
 9.3 Average endpoint quality of life score  
 9.4 Average change in quality of life scores  
 10. Economic outcomes  
 10.1 Costs of care  
 \* Primary outcomes of interest  
 Outcomes were divided into short-term (less than three months), medium term (three to 12 months) and long term (more than one year).

## Search methods for identification of studies

### 1. Electronic searches

We searched the Cochrane Schizophrenia Group's Trials Register (April 2005) using the phrase: [(*\*acup\** OR *\*moxibustion\**) in REFERENCE and (*\*acupuncture\** OR *\*moxibustion\**) in STUDY]

This register is compiled by systematic searches of major databases (Biological Abstracts CINAHL, the Cochrane Library, EMBASE, MEDLINE, RUSSMED, LILACS, PSYNDEX and PsycLIT) hand searches and conference proceedings (see Group Module).

2. We also inspected the references of all identified studies (included and excluded) for further relevant trials.

## Data collection and analysis

### 1. Selection of studies

We (JR, JX) inspected all reports of studies identified from the search. A randomly selected sample of 10% of all the reports were re-inspected in order to ensure that the selection was reliable. Where disagreement occurred, we resolved this by discussion and if there was still doubt we acquired the full article for further inspection. Once the full articles were obtained, we independently decided whether or not they met the review criteria. Again, where disagreement occurred, we resolved this by discussion and when this was not possible we sought further information from first authors and added these trials to the list of those awaiting assessment.

### 2. Assessment of methodological quality

We allocated trials to three quality categories, as described in the Cochrane Collaboration Handbook (Alderson 2004). When disputes arose as to which category a trial was allocated, again, we attempted resolution by discussion. When this was not possible and further information was necessary to clarify into which category to allocate the trial, we did not enter data but allocated the trial to the list of those awaiting assessment. We only included trials in Category A or B in the review.

A. Low risk of bias (adequate allocation concealment)

B. Moderate risk of bias (some doubt about the results)

C. High risk of bias (inadequate allocation concealment). For the purpose of the analysis in this review, trials were included if they met the Cochrane Handbook criteria A or B.

### 3. Data extraction

#### 3.1 Reliable extraction

We independently extracted data from selected trials. When disputes arose, we attempted resolution by discussion. When this was not possible and further information was necessary to resolve the dilemma, we did not enter data but added this outcome of the trial to the list of those awaiting assessment.

#### 3.2 Intention to treat analysis

We excluded data from studies where more than 50% of participants in any group were lost to follow up, except for the outcome of 'leaving the study early'. In studies with less than 50% dropout rate, everyone allocated to the intervention was counted whether or not they completed follow up. We considered those leaving early to have had the negative outcome, except for the event of death and adverse effects.

Where attrition rates were high (25-50%), we analysed the impact of including this type of data in a sensitivity analysis. If inclusion of high attrition data resulted in a substantive change in the estimate of effect, then we did not pool this data, but presented the data separately.

### 4. Data analysis

#### 4.1 Dichotomous/binary data

In the review we used relative risk (RR), (fixed effect) and 95% confidence interval (CI). Where possible, we made efforts to convert relevant categorical or continuous outcome measures to dichotomous data by identifying cut off points on rating scales and dividing them into groups accordingly i.e.. 'moderate or severe impairment' and 'no better or worse'.

4.1.1 Summary statistic: For binary outcomes we calculated a standard estimate of the relative risk (RR) and its 95% confidence intervals (CI) (fixed effect). Where possible, we estimated the number needed to treat (NNT) using an on-line calculator (<http://www.nntonline.net/>). If heterogeneity was found (see section 5) we used a random effects model.

#### 4.2 Continuous data

4.2.1 Skewed data: continuous data on clinical and social outcomes are often not normally distributed. To avoid the pitfall of applying parametric tests to non-parametric data, the following standards are applied to all data before inclusion: (a) standard deviations and means were reported in the paper or were obtainable from the authors; (b) when a scale started from the finite number zero, the standard deviation, when multiplied by two, was less than the mean (as otherwise the mean was unlikely to be an appropriate measure of the centre of the distribution, (Altman 1996); (c) if a scale started from a positive value (such as PANSS which can have values from 30-210) the calculation described above in (b) was modified to take the scale starting point into account. In

these cases skewness is present if  $2SD > (S - S_{min})$ , where  $S$  is the mean score and  $S_{min}$  is the minimum score. Endpoint scores on scales often have a finite start and end point and these rules can be applied to them.

4.2.2 Summary statistic: For continuous outcomes we calculated weighted mean differences (WMD) and respective 95% CI (fixed effect). If heterogeneity was found (see section 5) we used a random effects model.

4.2.3 Valid scales: A wide range of instruments are available to measure mental health outcomes. These instruments vary in quality and it has been shown that the use of rating scales which have not been described in a peer-reviewed journal (Marshall 2000) are associated with bias, or may not be valid, or even ad hoc. Therefore, some minimum standards were set: (a) the psychometric properties of the instrument should have been described in a peer-reviewed journal; (b) the instrument should either be a self-report, or completed by an independent rater or relative (not the therapist); and (c) the instrument should be a global assessment of an area of functioning.

4.2.4 Endpoint versus change data: where possible, we presented endpoint data and if both endpoint and change data were available for the same outcomes then we only reported the former in this review.

4.2.5 Cluster trials

Studies increasingly employ 'cluster randomisation' (such as randomisation by clinician or practice) but analysis and pooling of clustered data poses problems. Firstly, authors often fail to account for intra class correlation in clustered studies, leading to a 'unit of analysis' error (Divine 1992) whereby p values are spuriously low, confidence intervals unduly narrow and statistical significance overestimated. This causes type I errors (Bland 1997, Gulliford 1999).

Where clustering was not accounted for in primary studies, we presented the data in a table, with a (\*) symbol to indicate the presence of a probable unit of analysis error. In subsequent versions of this review we will seek to contact first authors of studies to obtain intra-class correlation co-efficients of their clustered data and to adjust for this using accepted methods (Gulliford 1999). Where clustering has been incorporated into the analysis of primary studies, we will also present these data as if from a non-cluster randomised study, but adjusted for the clustering effect.

We have sought statistical advice and have been advised that the binary data as presented in a report should be divided by a 'design effect'. This is calculated using the mean number of participants per cluster ( $m$ ) and the intraclass correlation co-efficient (ICC) [Design effect =  $1 + (m - 1) * ICC$ ] (Donner 2002). If the ICC was not reported it was assumed to be 0.1 (Ukoumunne 1999).

5. Test for heterogeneity

Firstly, we considered all of the included studies within any comparison to judge clinical heterogeneity. Then we visually inspected graphs used to investigate the possibility of statistical heterogeneity and supplemented this by using, primarily, the I-squared statis-

tic. This provides an estimate of the percentage of variability due to heterogeneity rather than chance alone. Where the I-squared estimate was greater than or equal to 75%, we interpreted this as indicating the presence of high levels of heterogeneity (Higgins 2003). If inconsistency was high, we did not summate the data, but presented it separately and reasons for heterogeneity were investigated.

6. Addressing publication bias

We entered all data from the included studies into a funnel graph (trial effect against trial size) in an attempt to investigate the likelihood of overt publication bias (Egger 1997).

7. General

Where possible, we entered data in such a way that the area to the left of the line of no effect indicated a favourable outcome for acupuncture.

## RESULTS

### Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#).

1. Excluded studies

We excluded three studies. Chongcheng 1985 and Zhuge 1993 were not randomised. Zhong 1995 compared electro-acupuncture to computerised electrode.

2. Awaiting assessment

No studies are awaiting assessment.

3. Ongoing studies

We are not aware of any ongoing studies.

4. Included studies

We included five studies all of which were randomised. Only Gang 1997 reported on blinding, in which the raters were blind to treatment allocation.

4.1 Length of trials

All included studies were short term (less than three months). The shortest study Zhang 1987 lasted for 20 days. Zhang 1991 was for five weeks, Gang 1997 and Zhang 2001 were six week studies and Zhang 1994 was the longest study lasting eight weeks.

4.2 Participants

All participants were diagnosed with schizophrenia. Gang 1997, Zhang 1991 and Zhang 2001 used operationalised criteria (DSM/ICD/CCMD). Zhang 1987, Zhang 1994 did not report using predefined diagnostic criteria. Gang 1997, Zhang 1987, Zhang 1991 and Zhang 2001 used male and female participants, whilst Zhang 1994 did not report on gender.

4.3 Setting

All five trials were undertaken in a hospital setting.

4.4 Study size

The numbers of participants randomised ranged between 31 [Zhang 1991](#) to 88 [Zhang 1987](#). Forty people were randomised by [Gang 1997](#), 69 by [Zhang 1994](#) and 42 by [Zhang 2001](#).

#### 4.5 Interventions

The treatment groups received acupuncture exclusively or in combination with antipsychotics. All the comparator groups received antipsychotics. [Gang 1997](#) used electro-acupuncture in combination with reduced dose antipsychotics versus chlorpromazine equivalents (~560mg/day). The treatment group in [Zhang 1987](#) received electro-acupuncture and the comparator group were given chlorpromazine (300-600 mg/day). [Zhang 1991](#) randomised people into three comparator groups, laser-acupuncture with moxibustion, laser acupuncture with moxibustion and reduced dose chlorpromazine (150-300 mg/day), or chlorpromazine (350-600 mg/day). [Zhang 1994](#) compared electro-acupuncture to chlorpromazine equivalents (~458 mg/day). [Zhang 2001](#) compared electro-acupuncture combined with antipsychotics to antipsychotics alone but did not report on the acupoints used or dosages. Details of acupuncture points, needles and electro-acupuncture frequencies used (when reported) are listed in the included studies table.

#### 4.6 Outcomes

All data outcomes were reported as short term (less than three months). Data from some studies were unusable because raw scores were not presented. Instead outcomes were reported as p-values without means and standard deviations being provided, or the scale used was not identified. [Zhang 2001](#) predefined no clinical improvement as HAMD scores reduced by  $\leq 25\%$ . [Gang 1997](#) predefined no clinical improvement as BPRS scores reduced by  $\leq 20\%$ .

4.6.1 Outcome scales: details of scales that provided usable data are shown below. Reasons for exclusion of data from instruments are given under 'outcomes' in the included studies table.

##### 4.6.1.1 Global state scales

###### 4.6.1.1.1 Clinical Global Impression Scale - CGI ([Guy 1970](#))

The CGI is a three-item scale commonly used in studies on schizophrenia that enables clinicians to quantify severity of illness and overall clinical improvement. The items are: severity of illness, global improvement and efficacy index. A seven-point scoring system is usually used with low scores indicating decreased severity and/or greater recovery. [Gang 1997](#) and [Zhang 1991](#) reported CGI data.

##### 4.6.1.2 Mental state

###### 4.6.1.2.1 Brief Psychiatric Rating Scale - BPRS ([Overall 1962](#))

The BPRS is an 18-item scale measuring positive symptoms, general psychopathology and affective symptoms. The original scale has sixteen items, but a revised eighteen-item scale is commonly used. Scores can range from 0 -126. Each item is rated on a seven-point scale, with high scores indicating more severe symptoms. [Gang 1997](#), [Zhang 1991](#) and [Zhang 1994](#) all reported BPRS data.

###### 4.6.1.2.2 Scale for the Assessment of Negative Symptoms - SANS ([Andreasen 1982](#))

This scale allows a global rating of the following negative symp-

oms: alogia (impoverished thinking), affective blunting, avolition-apathy, anhedonia-asociality and attention impairment. Assessments are made on a six-point scale (0=not at all to 5=severe). Higher scores indicate more symptoms. Data for this scale were reported by [Zhang 1994](#).

###### 4.6.1.2.3 Scale for the Assessment of Positive Symptoms - SAPS ([Andreasen 1982](#))

This six-point scale gives a global rating of positive symptoms such as delusions, hallucinations and disordered thinking. Higher scores indicate more symptoms. [Zhang 1994](#) was the only study to report SAPS data.

###### 4.6.1.2.4 Hamilton Rating Scale for Depression - HAMD ([Hamilton 1967](#))

This instrument is designed to be used only on patients already diagnosed as suffering from affective disorder of the depressive type. It is used for quantifying the results of an interview, and its value depends entirely on the skill of the interviewer in eliciting the necessary information. The scale contains 17 variables measured on either a five-point or a three-point rating scale, the latter being used where quantification of the variable is either difficult or impossible. Among the variables are: depressed mood, suicide, work and loss of interest, retardation, agitation, gastro-intestinal symptoms, general somatic symptoms, hypochondriasis, loss of insight, and loss of weight. It is useful to have two raters independently scoring a patient at the same interview. The scores of the patient are obtained by summing the scores of the two physicians. A score of 11 is generally regarded as indicative of a diagnosis of mild depression, 14-17 mild to moderate depression and >17 moderate to severe depression. [Zhang 2001](#) reported data for this scale.

###### 4.6.1.2.5 Zung Depression Scale - ZDS ([Zung 1965](#))

The Zung Self-Rating Depression Scale is a 20-item self-rated scale that is widely used as a screening tool, covering affective, psychological and somatic symptoms associated with depression. The questionnaire takes approximately ten minutes to complete and items are framed in terms of positive and negative statements. It can be effectively used in a variety of settings, including primary care, psychiatric clinics, drug trials and various research situations. Each item is scored on a Likert scale ranging from one to four. Most people with depression score between 50 and 69, while a score of 70 and above indicates severe depression. [Zhang 2001](#) reported data from this scale.

##### 4.6.1.3 Adverse events

###### 4.6.1.3.1 Treatment Emergent Symptom Scale/Form - TESS/F ([Guy 1976](#))

This checklist assesses a variety of characteristics for each adverse event, including severity, relationship to the drug, temporal characteristics (timing after a dose, duration and pattern during the day), contributing factors, course and action taken to counteract the effect. Symptoms can be listed a priori or can be recorded as observed by the investigator. [Zhang 1994](#) reported data for this scale.

## Risk of bias in included studies

### 1. Randomisation

It was stated that all included studies were randomised although the method of randomisation was not described in any of the studies. The numbers of participants in each arm were evenly balanced except for [Gang 1997](#) which randomised 25 into the acupuncture group and 15 into the control group.

### 2. Blindness

Blinding was only reported in one study ([Gang 1997](#)), with the raters being blind to the treatment allocation. Blinding was not reported in any of the other trials.

### 3. Loss to follow up

Follow up was good and it was reported that no-one was lost to follow up in any of the studies.

### 4. Data reporting

Overall, outcomes derived from scales provided usable data and unusable data was only reported in a few studies.

### 5. General

There was considerable variation in the type of acupuncture intervention (acupuncture, electro-acupuncture, laser-acupuncture) and the strategies used (different acupuncture points and dosages used). [Gang 1997](#) reported on the points and type of needles and the frequency and amps used. [Zhang 1987](#) reported on the type of needle and points used, but did not report on the frequency or amps. [Zhang 1991](#) reported the points, laser power and laser fibre width used. [Zhang 1994](#) did report on the acupuncture points used, but did not report on the needle type or frequency used. [Zhang 2001](#) described the points used, but additional data on needle type, frequency or amps were not provided.

## Effects of interventions

### 1. The search

The electronic search identified 18 reports. We were able to include five trials and we added three trials to the excluded studies table.

### 2. COMPARISON 1. ACUPUNCTURE versus ANTIPSYCHOTICS

#### 2.1. Global state

Two studies [Zhang 1987](#) and [Zhang 1991](#) reported on global state (not improved) with equivocal results.

#### 2.2. Leaving the study early

There were no losses to follow up in either group from two trials [Zhang 1987](#) and [Zhang 1991](#) by five weeks.

#### 2.3. Adverse events

Extrapyramidal symptoms reported by [Zhang 1991](#) were lower in the acupuncture group with no participants experiencing this adverse effect. The control group had significantly higher numbers with eight out of ten people reported as having extrapyramidal symptoms (n=21, RR 0.05 CI 0.0 to 0.8, NNT 2 CI 2 to 8).

### 3. COMPARISON 2. ACUPUNCTURE + ANTIPSYCHOTICS versus ANTIPSYCHOTICS

#### 3.1. Global state

One study [Zhang 1991](#) reported global state (not improved at five weeks) with equivocal results. Clinical Global Impression (severity of illness) scores were reported by [Gang 1997](#) with equivocal scores. [Gang 1997](#) also reported on Clinical Global Impression (global improvement) but data were skewed.

#### 3.2. Leaving the study early

Four trials ([Zhang 1991](#), [Zhang 1994](#), [Gang 1997](#), [Zhang 2001](#)) reported as short term outcomes that no participants left the study early (up to eight weeks).

#### 3.3. Mental state

Dichotomised BPRS data were reported by [Gang 1997](#) (not improved  $\leq 20\%$  reduction at endpoint) with equivocal results. Continuous BPRS data ([Zhang 1994](#), [Gang 1997](#)) were significant in favour of the acupuncture group (n=109, WMD -4.31 CI -7.0 to -1.6). Mental state SANS and SAPS score were reported by [Zhang 1994](#), but data were skewed and cannot be displayed graphically. Depression scores from the HAMD scale were reported by [Zhang 2001](#) with scores from this smaller study being significantly lower in the acupuncture group (n=42, WMD -10.41 CI -12.8 to -8.0). When the HAMD scores were dichotomised to 'not improved', again, by [Zhang 2001](#) results significantly favoured the acupuncture group (n=42, RR 0.17 CI 0.1 to 0.5, NNT 2 CI 2 to 3). [Zhang 2001](#) also reported on depression using the Zung Depression Scale with results at five weeks significantly favouring the acupuncture group (n=42, WMD -24.25 CI -28.0 to -20.5).

#### 3.4. Adverse events

[Gang 1997](#) reported TESS scores at six weeks, with results significantly favouring the acupuncture group (n=40, WMD -0.50 CI -0.9 to -0.1). [Zhang 1991](#) found the incidences of extrapyramidal symptoms to be similar for both treatment groups.

## DISCUSSION

### 1. General

Five studies were included with the total number of people randomised being 262 ([Gang 1997](#) = 40, [Zhang 1987](#) = 80, [Zhang 1991](#) = 31, [Zhang 1994](#) = 69 and [Zhang 2001](#) = 42). The data available put the age range of participants between 16 and 55 years. Two trials compared acupuncture to antipsychotics ([Zhang 1987](#) and [Zhang 1991](#)) and four trials compared acupuncture combined with antipsychotics to antipsychotics alone ([Gang 1997](#), [Zhang 1991](#), [Zhang 1994](#) and [Zhang 2001](#)). Electro-acupuncture was used by [Gang 1997](#), [Zhang 1987](#), [Zhang 1994](#) and [Zhang 2001](#). Laser-acupuncture was used by [Zhang 1991](#). Operational criteria (CCMD-2, ICD-10 and DSM III R) were reported in three studies and two studies did not state which diagnostic criteria were used. Length of illness varied within studies. [Zhang 1991](#) included people with recent onset schizophrenia (three months) and people with chronic schizophrenia up to 22 years. [Zhang 2001](#) in-

cluded people with illness duration between seven months to 16 years. [Gang 1997](#) included people with mean length of illness at 8.2 years. [Zhang 1987](#) included people who were mostly first admissions and [Zhang 1994](#) included people with a mean length of illness of ten years. All five studies were conducted in a hospital setting. Only one study ([Gang 1997](#)) reported that acupuncture was allocated according to TCM pattern differentiation theory. The antipsychotics used were chlorpromazine ([Zhang 1987](#), [Zhang 1991](#)), chlorpromazine equivalents ([Gang 1997](#), [Zhang 1994](#)), and [Zhang 2001](#) did not specify those antipsychotics used. In none of the trials was data included on quality of life, service utilisation or economic outcomes.

## 2. Quality of reporting

Overall, the quality of reporting was poor and it was not described in any of the studies how the randomisation was conducted. Blinding was only reported in one of the studies. We classified all studies as category B (unclear allocation concealment) with a moderate risk of overestimating the estimate of effect.

## 3. COMPARISON 1. ACUPUNCTURE versus ANTIPSYCHOTICS

### 3.1 Global state

The outcomes for global state 'not improved' were equivocal. The result was from two small studies ([Zhang 1987](#), [Zhang 1991](#)) randomising a total of 109 people. Treatment response in the first admission group ([Zhang 1987](#)) may have been different than the chronically ill group ([Zhang 1991](#)) who may have had higher incidences of negative symptoms, but no obvious differences were found and data were pooled.

### 3.2 Leaving the study early

Retention rates were good with no participants leaving the study early from either the acupuncture or the antipsychotics groups. Such high rates of retention are unusual for trials involving people with schizophrenia and probably reflect the differences in approaches to care, rather than the treatment interventions.

### 3.3 Adverse events

Adverse events data were limited and only extrapyramidal symptoms were reported. No-one in the acupuncture group experienced extrapyramidal symptoms, whilst those receiving antipsychotics (chlorpromazine) had significantly higher (8/10) levels of extrapyramidal adverse events; this reflects the known neurological side effects of antipsychotic medication.

## 4. COMPARISON 2. ACUPUNCTURE + ANTIPSYCHOTICS versus ANTIPSYCHOTICS

### 4.1 Global state

Global state outcomes were equivocal for the acupuncture/antipsychotic group compared to those given just antipsychotics. Results were limited from the single study (n=20, [Zhang 1991](#)).

### 4.2 Leaving the study early

Loss to follow up was very good with none of the participants leaving the study early over the short term (4 RCTs, n=171).

### 4.3 Mental state

BPRS data did favour the acupuncture/antipsychotic group. However, this finding was not consistent with dichotomous BPRS data, which makes it difficult to draw firm conclusions. Depression scores from the HAMD (both continuous and dichotomous data) and ZDS were significantly lower in the acupuncture groups, although with only 42 people included in these groups we are unable to conclude anything definite from the results.

### 4.4 Adverse events

Treatment emergent adverse event (TESS) scores were lower for those given acupuncture and antipsychotic treatment. However, here again these results are based on a study size of only 40 people and larger studies are needed before we can draw firm conclusions. The occurrence of extrapyramidal symptoms was similar for both groups; both groups received chlorpromazine.

## AUTHORS' CONCLUSIONS

### Implications for practice

In this review we did not find any clear evidence that acupuncture, when used alone, offers greater benefits than antipsychotic medication; however, any conclusions were limited by the data available (two small, short-term trials). When acupuncture was combined with antipsychotics, most outcomes were equivocal, and significant outcomes were limited by the small numbers of participants. Depression outcomes were consistently lower in the combined acupuncture/antipsychotic group, but again these findings were limited by the study size. Users of care and clinicians need much more comprehensive evidence to feel confident about any potential benefits of acupuncture for schizophrenia.

### Implications for research

#### 1. General

This review of acupuncture for schizophrenia would have proved more informative for clinicians and people with schizophrenia if the guidelines in the CONSORT ([Moher 2001](#)) statement and STRICTA ([MacPherson 2001](#)) recommendations had been followed. Clear descriptions of the randomisation undertaken in the studies would have helped to determine if selection bias had been minimised. Well described and tested blinding could have encouraged confidence in the control of performance and detection bias. Attempts to blind control groups with sham acupuncture would have reassured the reader that outcomes are as free from bias as possible.

## 2. Specific

In only one trial was acupuncture applied according to TCM pattern differentiation theory; all other trials used acupuncture as a preset protocol for schizophrenia regardless of the TCM diagnosis. It might be preferable to assess the use of acupuncture for schizophrenia by incorporating TCM pattern differentiation into the design of clinical trials, since this distinct methodological paradigm of individualised treatment may be more effective/appropriate than using a standardised acupuncture protocol. Acupuncture point protocols are often used within a Western diagnosis both in China and the West and how this affects outcomes is unclear. Whichever method is chosen, the authors should report the treatment rationale in accordance with the STRICTA (MacPherson 2001) recommendations to facilitate their evaluation. Sham acupuncture was not used as a means of minimising the placebo effect in any of the trials.

This review highlights the need for clinical trials which evaluate acupuncture for people with schizophrenia, with trialists employing correct methodology. Further research is essential to inform both clinicians and patients about the effects of acupuncture in the treatment of schizophrenia. Trial methodology should follow both the CONSORT and STRICTA guidelines.

## ACKNOWLEDGEMENTS

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## REFERENCES

### References to studies included in this review

#### Gang 1997 *{published data only}*

Gang Z, Shu Bai J, Liang Dong Z. Comparative clinical study on the treatment of schizophrenia with electroacupuncture and reduced doses of antipsychotic drugs. *American Journal of Acupuncture* 1997;**25**(1):25–31. [MEDLINE: 97142925; : PMID 8988936]

Zhou G, Jin SB, Zhang LD. Comparative clinical study on the treatment of schizophrenia with electroacupuncture and reduced doses of antipsychotic drugs. *American Journal of Acupuncture* 1997; **25**(1):25–31. [: 153rd Annual Meeting of the American Psychiatric Association [CD-ROM]: MARATHON Multimedia, 2000 NR80]

#### Zhang 1987 *{published data only}*

Zhang LD, Tang YH, Zhu WB, Xu SH. Comparative study of schizophrenia treatment with electroacupuncture, herbs and chlorpromazine. *Chinese Medical Journal* 1987;**100**:152–7.

Zhang LD, Xu SH, Tang YH, Zhu WB. A comparative study of the treatment of schizophrenia with electric acupuncture, herbal

decoction and chlorpromazine. *American Journal of Acupuncture* 1990;**18**(1):11–4. [MEDLINE: 99343121; : PMID 10416732]

#### Zhang 1991 *{published data only}*

Zhang B. A controlled study of clinical therapeutic effects of laser acupuncture for schizophrenia. *Chung Hua Shen Ching Ching Shen Ko Tsa Chih (Chinese Journal of Neurology and Psychiatry)* 1991;**24**(2):81-3, 124. [MEDLINE: 91317070; : PMID 1860386]

#### Zhang 1994 *{published data only}*

Zhang B, Meng SR, Yu J. Clinical therapeutic effect of mentality electroacupuncture on schizophrenia. *Chinese Acupuncture and Moxibustion* 1994;**17**(1):17–20. [: MED19402]

#### Zhang 2001 *{published data only}*

Zhang Y, Shao H, Zhao X. The clinical efficacy with intelligent electro-acupuncture of treating schizophrenia with depressive symptoms. *Chinese Journal of Behavioral Medical Science* 2001;**10**(1):44–5. [: MED10104]

### References to studies excluded from this review

**Chongcheng 1985** *{published data only}*

Chongcheng X, Huansen X, Qingchi R, Yuande C, Dingli L. Electric acupuncture convulsive therapy. *Convulsive Therapy* 1985; **1**(4):242–51. [MEDLINE: 94072826; : PMID 8251722]

**Zhong 1995** *{published data only}*

Zhong H, Feng X, Luo H, Jia Y, Zhao X. Comparative observation on treatment of psychosis with electrode and electro-acupuncture controlled by processors. *World Journal Acupuncture-Moxibustion* 1995; **5**(3):24–7. [: MED19585]

**Zhuge 1993** *{published data only}*

Zhuge DY, Chen JK. Comparison between electro-acupuncture with chlorpromazine and chlorpromazine alone in 60 schizophrenic patients. *Chung-Kuo Chung Hsi i Chieh Ho Tsa Chih* 1993; **13**(7): 408–9. [MEDLINE: 94072826; : PMID 8251722]

**Additional references****Alderson 2004**

Alderson P, Green S, Higgins JPT. Cochrane Reviewers' Handbook 4.2.2 [updated December 2003]. *The Cochrane Library* 2004, Issue Issue 1. [: In: The Cochrane Library, Issue 1, 2004. Chichester, UK: John Wiley & Sons, Ltd.]

**Altman 1996**

Altman DG, Bland JM. Detecting skewness from summary information. *BMJ* 1996; **313**:1200. [: OLZ020600]

**Andreasen 1982**

Andreasen NC. Negative symptoms in schizophrenia. Definition and reliability. *Archives of General Psychiatry* 1982; **39**:784–8.

**Bland 1997**

Bland JM. Statistics notes. Trials randomised in clusters. *BMJ* 1997; **315**:600.

**Divine 1992**

Divine GW, Brown JT, Frazier LM. The unit of analysis error in studies about physicians' patient care behavior. *Journal of General Internal Medicine* 1992; **7**(6):623–9.

**Donner 2002**

Donner A, Klar N. Issues in the meta-analysis of cluster randomized trials. *Statistics in Medicine* 2002; **21**:2971–80.

**Egger 1997**

Egger M, Davey-Smith G, Schneider M, Minder CSO. Bias in meta-analysis detected by a simple, graphical test. *BMJ* 1997; **13**: 629–34.

**Ernst 2001**

Ernst E, A White. Prospective studies of the safety of acupuncture: a systematic review. *American Journal of Medicine* 2001; **110**:481–5.

**Gulliford 1999**

Gulliford MC. Components of variance and intraclass correlations for the design of community-based surveys and intervention studies: data from the Health Survey for England 1994. *American Journal of Epidemiology* 1999; **149**:876–83.

**Guy 1970**

Guy W, Bonato RR, eds. Clinical Global Impressions. In: *Manual for the ECDEU Assessment Battery 2. Rev ed.* National Institute of Mental Health, 1970.

**Guy 1976**

Guy W. *ECDEU Assessment Manual for Psychopharmacology (DOTES: Dosage Record and Treatment Emergent Symptom Scale)*. Rockville: National Institute of Mental Health, 1976.

**Hamilton 1967**

Hamilton M. Development of a rating scale for primary depressive illness. *Br J Soc Clin Psychol* 1967; **4**(Dec, 6):278–96.

**Higgins 2003**

Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ* 2003; **327**:557–60.

**Kaptchuk 2002**

Kaptchuk TJ. Acupuncture: Theory, Efficacy, and Practice. *American College of Physicians - American Society of Internal Medicine* 2002; **136**:374–83.

**MacPherson 2001**

MacPherson H, White A, Cummings M, Jobst K, Rose K, Niemtow R. Standards for reporting interventions in controlled trials of acupuncture: the STRICTA recommendations. *Complementary Therapies in Medicine* 2001; **9**:246–49.

**MacPherson 2001a**

MacPherson H, Thomas K, Walters S, Fitter M. The York acupuncture safety study: prospective survey of 34 000 treatments by traditional acupuncturists. *2001 BMJ*; **323**(Sept):486–7.

**Marshall 2000**

Marshall M, Lockwood A, Bradley C, Adams C, Joy C, Fenton M. Unpublished rating scales: a major source of bias in randomised controlled trials of treatments for schizophrenia. *British Journal of Psychiatry* 2000; **176**:249–52.

**Ming 2001**

Translated by Zhu Ming. *The Medical Classics of the Yellow Emperor*. Beijing: Foreign Language Press, 2001.

**Moher 2001**

Moher D, Schulz KF, Altman D. The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomized trials. *JAMA* 2001; **285**:1987–91.

**Overall 1962**

Overall JE, Gorham DR. The Brief Psychiatric Rating Scale. *Psychological Reports* 1962; **10**:799–812.

**Ukoumunne 1999**

Ukoumunne OC, Gulliford MC, Chinn S, Sterne JAC, Burney PGJ. Methods for evaluating area-wide and organisation-based intervention in health and health care: a systematic review. *Health Technology Assessment* 1999; **3**(5):1–75.

**Xu 1991**

Xu X. *The English-Chinese Encyclopedia of Practical Traditional Chinese Medicine*. Beijing: Higher Education Press, 1991.

**Zhang 1996**

Zhang Jizhi. Current status of integrated traditional and Western medicine study on schizophrenia. *Chinese Journal of Integrated traditional and Western medicine* 1996; **16**(11):643–45.

**Zung 1965**

Zung WW. A Self-Rating Depression Scale. *Archives of General Psychiatry* 1965; **12**:63–70.

\* Indicates the major publication for the study

## CHARACTERISTICS OF STUDIES

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

#### Gang 1997

Methods	Allocation: randomised. Blindness: single blind (raters blinded). Duration: 6 weeks. Design: parallel groups (with pattern differentiation).	
Participants	Diagnosis: schizophrenia (DSM III; CMA); Traditional Chinese Medicine classification (Yang deficiency; Yin deficiency; Phlegm). History: mean length of illness 8.2 years. N=40. Age: mean 31.8 years. Sex: 23 M, 17 F. Setting: hospital. Excluded: serious heart, liver, kidney or other somatic diseases.	
Interventions	1. Electro-acupuncture and antipsychotics: dose electro-acupuncture OD (except Sundays), antipsychotics, given at reduced dose ~40% reduction of their usual medication. N=25. 2. Chlorpromazine equivalents: dose ~560 mg/day. N=15. Main acupuncture points used: Yintang tou xinqu Daling (PC-7) Neiguan (PC-6) Taiyang (Ex-HN-5) Supplemental points: For yang deficiency: zuansli (ST-36) For yin deficiency: sanyinjiao (SP-6) For persistent phlegm: fengling (ST-40) Electro-acupuncture frequency 180 cycles per second, pulse width 500 microseconds and current up to 60mA. Needles: stainless steel filiform, gauge #30, length 40mm.	
Outcomes	Leaving the study early. Global state: CGI-S, CGI-I. Mental state: BPRS. Adverse events: TESS.	
Notes		
<b>Risk of bias</b>		
<b>Item</b>	<b>Authors' judgement</b>	<b>Description</b>
Allocation concealment?	Unclear	B - Unclear

**Zhang 1987**

Methods	Allocation: 'divided into groups randomly'. Blindness: not reported. Duration: 20 days. Design: parallel groups (without pattern differentiation).	
Participants	Diagnosis: schizophrenia. History: mostly first admissions. N=88. Age: 16-51 years. Sex: 39 M, 49 F. Setting: hospital. Excluded: those who showed remission of symptoms on admission.	
Interventions	1. Electro-acupuncture: dose bid, ~35-50 minutes duration. N=43. 2. Chlorpromazine: dose 300-600 mg/day. N=45. Electro-acupuncture points used: Yi feng (SJ-17) Ting Gong (SI 19) Tou Nie (non meridinal points) Cheng Ling (GB-18) Lin Qi (GB 41) Bai Hu (Gv 20) Ding Shen (non meridinal points) Needles: stainless steel, gauge 28, length 33 mm.	
Outcomes	Leaving the study early. Global impression: not improved (defined as no change in symptoms).	
Notes		
<b><i>Risk of bias</i></b>		
<b>Item</b>	<b>Authors' judgement</b>	<b>Description</b>
Allocation concealment?	Unclear	B - Unclear

**Zhang 1991**

Methods	Allocation: randomised. Blindness: unclear. Duration: 5 weeks. Design: three treatment arms (without pattern differentiation).	
Participants	Diagnosis: schizophrenia (DSM III; CCMD-2). History: Mean length of illness 3 months to 22 years. N=31. Age: 17-55. Sex: male and female.	

**Zhang 1991** (Continued)

	Setting: hospital.	
Interventions	<p>1. Laser acupuncture and moxibustion: dose 15 minutes/6 days/week. N=11.</p> <p>2. Laser acupuncture/moxibustion, plus chlorpromazine: dose 15 minutes/6 days/week, chlorpromazine 150-300 mg/day. N=10.</p> <p>3. Chlorpromazine: dose 350-600 mg/day. N=10.</p> <p>Points used: Da zhui (GV 14) and shen ting (GV 24) followed by shuang tai yang on alternate days. Laser fibre output &gt;2 milliwatts, no further details.</p>	
Outcomes	<p>Leaving the study early.</p> <p>Global state: CGI.</p> <p>Adverse events: Extrapyramidal symptoms.</p> <p>Unable to use -</p> <p>Mental state: BPRS (no usable data).</p>	
Notes		
<b>Risk of bias</b>		
<b>Item</b>	<b>Authors' judgement</b>	<b>Description</b>
Allocation concealment?	Unclear	B - Unclear

**Zhang 1994**

Methods	<p>Allocation: randomised.</p> <p>Blindness: not reported.</p> <p>Duration: 8 weeks.</p> <p>Design: parallel groups (without pattern differentiation).</p>	
Participants	<p>Diagnosis: schizophrenia.</p> <p>History: mean length of illness 10 years.</p> <p>N=69.</p> <p>Age: mean 37.3 years.</p> <p>Sex: not reported.</p> <p>Setting: hospital.</p>	
Interventions	<p>1. Electro-acupuncture (computer controlled): dose 45 minutes/OD. N=38.</p> <p>2. Antipsychotics: dose 'patients usual drugs and dose', chlorpromazine equivalents of ~458 mg/day (no further details). N=31.</p> <p>Points used: Yin tang and Bai hui (Gv 20) followed by shen ting (GV 24) and ya men (GV 15) on alternate days. Needles type and frequency used not reported.</p>	
Outcomes	<p>Leaving the study early.</p> <p>Mental state: BPRS, SANS, SAPS.</p>	

**Zhang 1994** (Continued)

Notes		
<b>Risk of bias</b>		
<b>Item</b>	<b>Authors' judgement</b>	<b>Description</b>
Allocation concealment?	Unclear	B - Unclear

**Zhang 2001**

Methods	Allocation: randomised. Blindness: not reported. Duration: 6 weeks. Design: parallel groups (without pattern differentiation).	
Participants	Diagnosis: schizophrenia (ICD; CCMD-2). History: duration of illness, range 7 months to 16 years. N=42. Age: range 17-54 years. Sex: male and female. Setting: hospital.	
Interventions	1. Electro-acupuncture and antipsychotics: dose electro-acupuncture 45 minutes/day/Monday-Friday, plus antipsychotics (no further details). N=22. 2. Antipsychotics: dose (no further details). N=20. Points used: Yin tang and Bai hui (Gv 20). Needle type and frequency used not reported.	
Outcomes	Mental state: HAMD, ZDS.	
Notes		
<b>Risk of bias</b>		
<b>Item</b>	<b>Authors' judgement</b>	<b>Description</b>
Allocation concealment?	Unclear	B - Unclear

Diagnostic tools and scales:

DSM - Diagnostic and Statistical Manual

ICD 10 - International Classification of Diseases

CCMD 2-R - Chinese Classification of Mental Disorders Second Edition Revised

Global state -

CGI - Clinical Global Impression

Mental state -

BPRS - Brief Psychiatric Rating Scale

SANS - Scale for the Assessment of Negative Symptoms  
SAPS - Scale for the Assessment of Positive Symptoms  
HAMD - Hamilton Rating Scale for Depression  
ZDS - Zung Depression Scale  
Adverse events -  
TESS - Treatment Emergent Symptom Scale

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

Chongcheng 1985	Allocation: unclear. Participants: people with schizophrenia. Interventions: electro-acupuncture versus ECT.
Zhong 1995	Allocation: unclear. Participants: people with psychosis. Interventions: electro-acupuncture versus computerised electrode.
Zhuge 1993	Allocation: not randomised.

## DATA AND ANALYSES

### Comparison 1. ACUPUNCTURE versus ANTIPSYCHOTICS

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Global state: Not improved, endpoint (short term)	2	109	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.68, 1.64]
2 Behaviour: Leaving the study early (short term)	2	109	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
3 Adverse events: Extrapyramidal symptoms (short term)	1	21	Risk Ratio (M-H, Fixed, 95% CI)	0.05 [0.00, 0.83]

### Comparison 2. ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Global state: 1. Not improved, endpoint (short term)	1	20	Risk Ratio (M-H, Fixed, 95% CI)	0.8 [0.30, 2.13]
2 Global state: 2. CGI - severity of illness, endpoint (short term, high score=worse)	1	40	Mean Difference (IV, Fixed, 95% CI)	-0.40 [-1.08, 0.28]
3 Global state: 3. CGI - global improvement, endpoint (short term, skewed data)			Other data	No numeric data
4 Behaviour: Leaving the study early (short term)	4	171	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
5 Mental state: 1. BPRS, not improved < /=20% reduction at endpoint (short term)	1	40	Risk Ratio (M-H, Fixed, 95% CI)	0.9 [0.30, 2.68]
6 Mental state: 2. BPRS, endpoint (short term, high score=worse)	2	109	Mean Difference (IV, Fixed, 95% CI)	-4.31 [-7.04, -1.58]
7 Mental state: 3. SANS, endpoint (high score=worse, skewed data)			Other data	No numeric data
8 Mental state: 3. SAPS, endpoint (high score=worse, skewed data)			Other data	No numeric data
9 Mental state: 4. HAMD, not improved < 25% reduction at endpoint (short term)	1	42	Risk Ratio (M-H, Fixed, 95% CI)	0.17 [0.06, 0.50]
10 Mental state: 5. HAMD, endpoint (short term, high score=worse)	1	42	Mean Difference (IV, Fixed, 95% CI)	-10.41 [-12.81, -8.01]

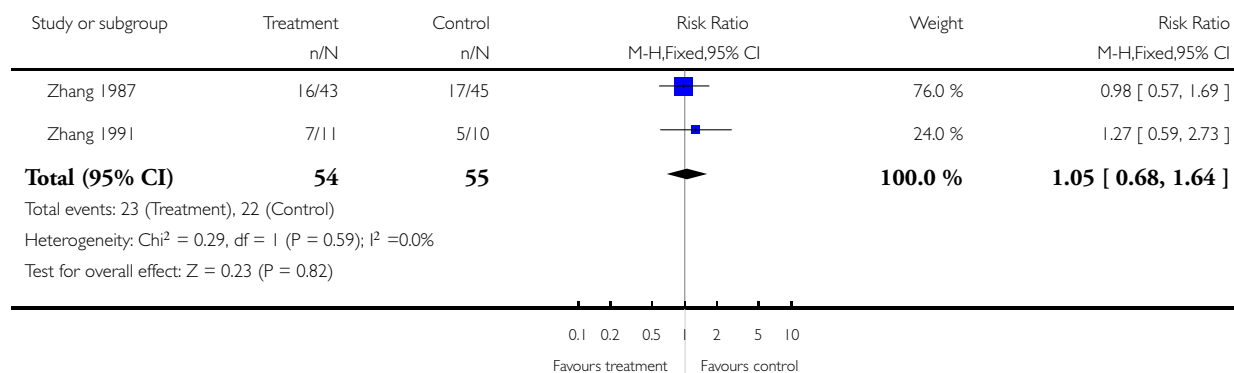
11 Mental state: 6. ZDS, endpoint, (short term, high score=worse)	1	42	Mean Difference (IV, Fixed, 95% CI)	-24.25 [-28.01, -20.49]
12 Adverse events: 1. TESS, endpoint (short term, high score=worse)	1	40	Mean Difference (IV, Fixed, 95% CI)	-0.5 [-0.86, -0.14]
13 Adverse events: 2. Extrapyramidal symptoms (short term)	1	20	Risk Ratio (M-H, Fixed, 95% CI)	0.88 [0.53, 1.46]

**Analysis 1.1. Comparison 1 ACUPUNCTURE versus ANTIPSYCHOTICS, Outcome 1 Global state: Not improved, endpoint (short term).**

Review: Acupuncture for schizophrenia

Comparison: 1 ACUPUNCTURE versus ANTIPSYCHOTICS

Outcome: 1 Global state: Not improved, endpoint (short term)

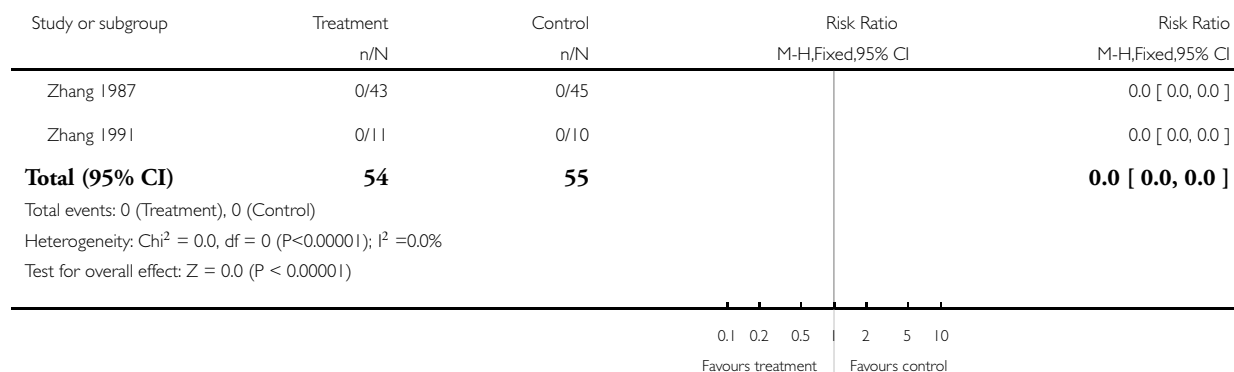


### Analysis 1.2. Comparison 1 ACUPUNCTURE versus ANTIPSYCHOTICS, Outcome 2 Behaviour: Leaving the study early (short term).

Review: Acupuncture for schizophrenia

Comparison: 1 ACUPUNCTURE versus ANTIPSYCHOTICS

Outcome: 2 Behaviour: Leaving the study early (short term)

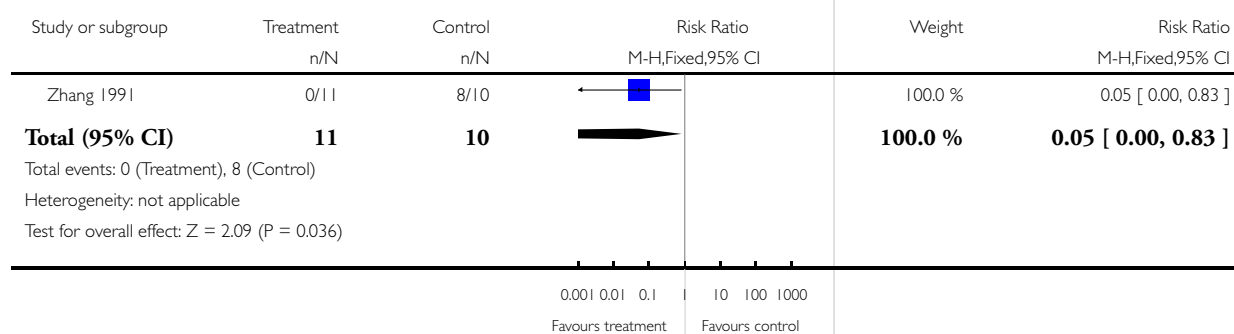


### Analysis 1.3. Comparison 1 ACUPUNCTURE versus ANTIPSYCHOTICS, Outcome 3 Adverse events: Extrapyramidal symptoms (short term).

Review: Acupuncture for schizophrenia

Comparison: 1 ACUPUNCTURE versus ANTIPSYCHOTICS

Outcome: 3 Adverse events: Extrapyramidal symptoms (short term)

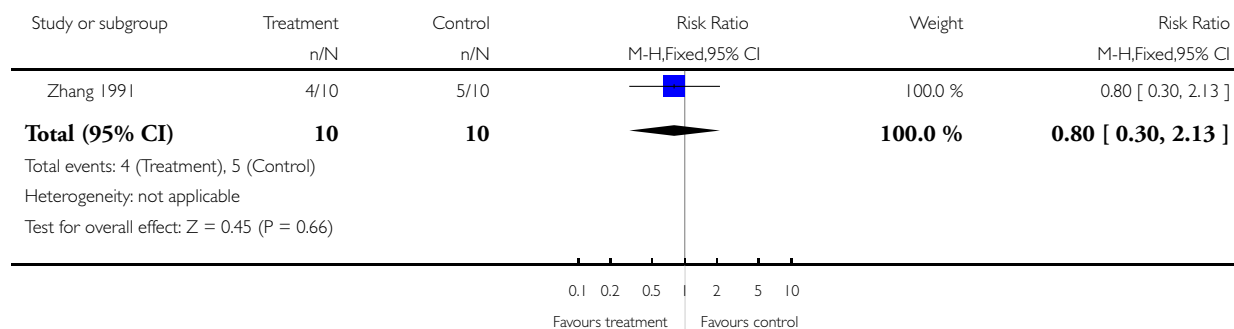


**Analysis 2.1. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 1 Global state: 1. Not improved, endpoint (short term).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 1 Global state: 1. Not improved, endpoint (short term)

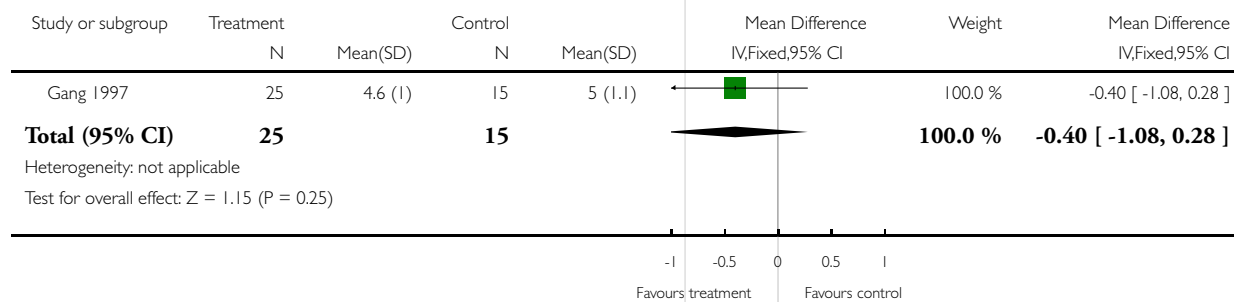


**Analysis 2.2. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 2 Global state: 2. CGI - severity of illness, endpoint (short term, high score=worse).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 2 Global state: 2. CGI - severity of illness, endpoint (short term, high score=worse)



**Analysis 2.3. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 3 Global state: 3. CGI - global improvement, endpoint (short term, skewed data).**

Global state: 3. CGI - global improvement, endpoint (short term, skewed data)

Gang 1997	1. Electro-acupuncture versus antipsychotics.	2.2	1.1	25
Gang 1997	2. Antipsychotics	2.3	1.3	15

**Analysis 2.4. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 4 Behaviour: Leaving the study early (short term).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 4 Behaviour: Leaving the study early (short term)

Study or subgroup	Treatment	Control	Risk Ratio	
	n/N	n/N	M-H,Fixed,95% CI	M-H,Fixed,95% CI
Gang 1997	0/25	0/15		0.0 [ 0.0, 0.0 ]
Zhang 1991	0/10	0/10		0.0 [ 0.0, 0.0 ]
Zhang 1994	0/38	0/31		0.0 [ 0.0, 0.0 ]
Zhang 2001	0/22	0/20		0.0 [ 0.0, 0.0 ]
<b>Total (95% CI)</b>	<b>95</b>	<b>76</b>		<b>0.0 [ 0.0, 0.0 ]</b>

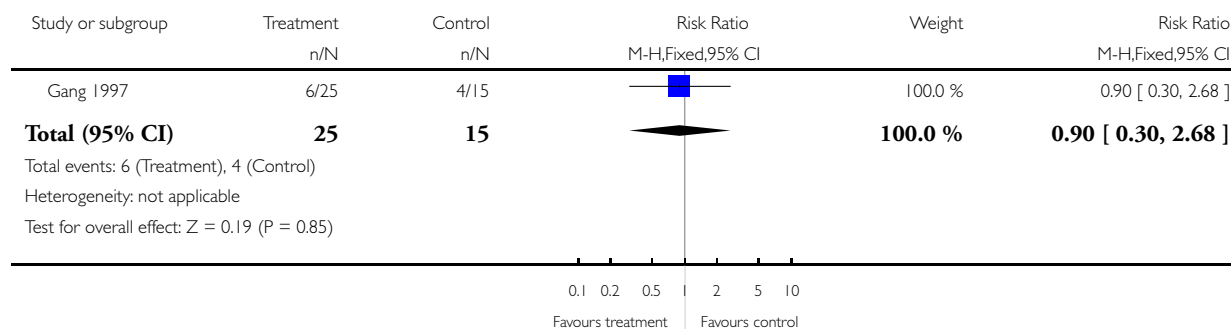
Total events: 0 (Treatment), 0 (Control)  
Heterogeneity: Chi<sup>2</sup> = 0.0, df = 0 (P<0.00001); I<sup>2</sup> = 0.0%  
Test for overall effect: Z = 0.0 (P < 0.00001)

**Analysis 2.5. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 5 Mental state: 1. BPRS, not improved  $\leq 20\%$  reduction at endpoint (short term).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 5 Mental state: 1. BPRS, not improved  $\leq 20\%$  reduction at endpoint (short term)

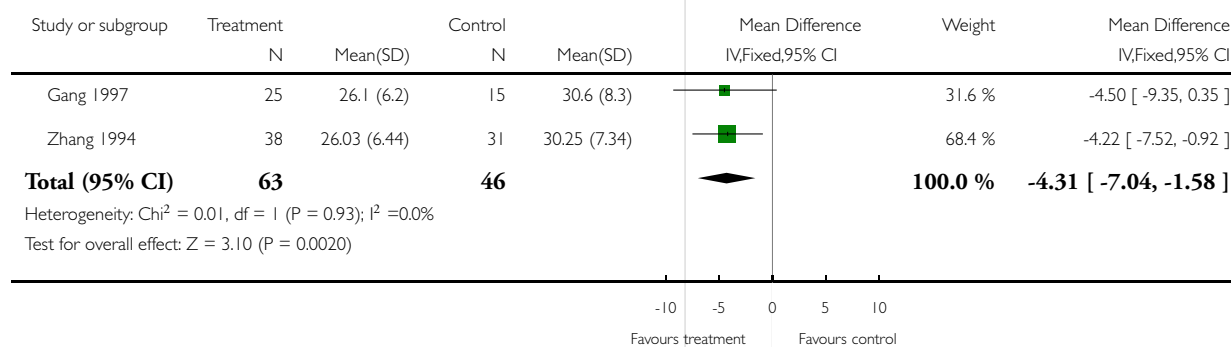


**Analysis 2.6. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 6 Mental state: 2. BPRS, endpoint (short term, high score=worse).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 6 Mental state: 2. BPRS, endpoint (short term, high score=worse)



**Analysis 2.7. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 7 Mental state: 3. SANS, endpoint (high score=worse, skewed data).**

Mental state: 3. SANS, endpoint (high score=worse, skewed data)

Zhang 1994	1. Electro-acupuncture plus antipsychotics.	24.97	20.86	38
Zhang 1994	2. Antipsychotics.	37.20	16.02	31

**Analysis 2.8. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 8 Mental state: 3. SAPS, endpoint (high score=worse, skewed data).**

Mental state: 3. SAPS, endpoint (high score=worse, skewed data)

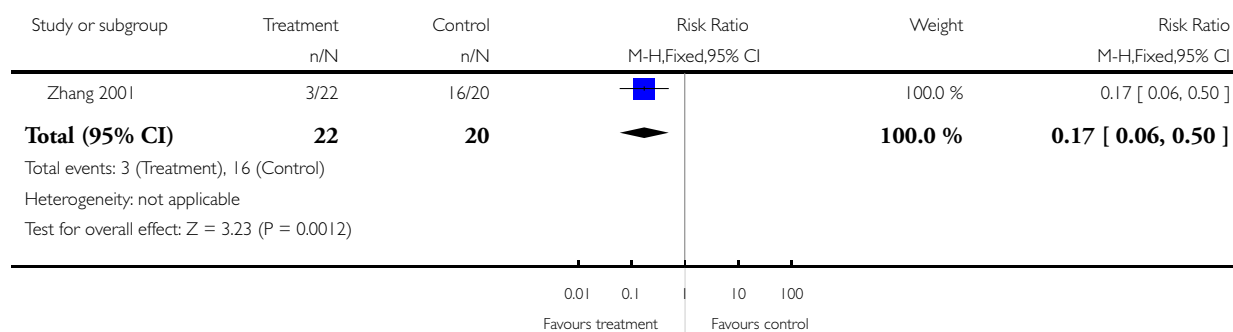
Zhang 1994	1. Electro-acupuncture plus antipsychotics	6.71	6.15	38
Zhang 1994	2. Antipsychotics	10.65	6.95	31

**Analysis 2.9. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 9 Mental state: 4. HAMD, not improved <25% reduction at endpoint (short term).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 9 Mental state: 4. HAMD, not improved <25% reduction at endpoint (short term)

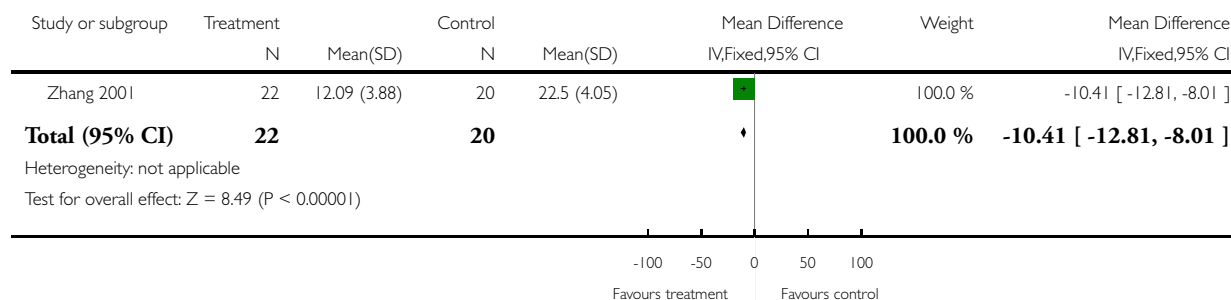


**Analysis 2.10. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 10 Mental state: 5. HAMD, endpoint (short term, high score=worse).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 10 Mental state: 5. HAMD, endpoint (short term, high score=worse)

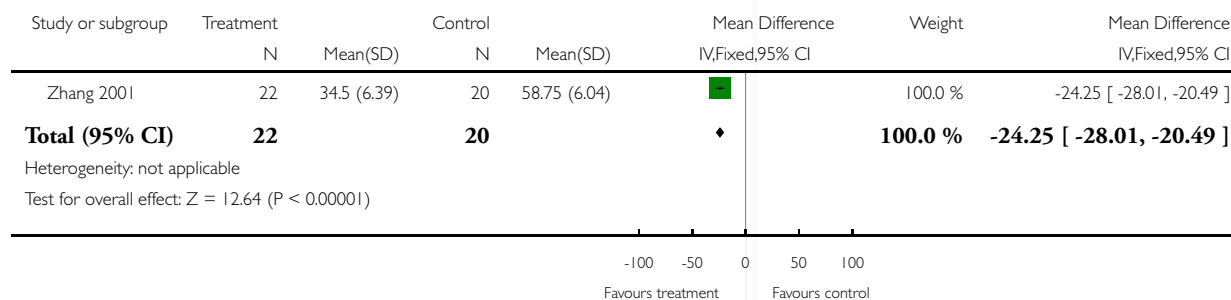


**Analysis 2.11. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 11 Mental state: 6. ZDS, endpoint, (short term, high score=worse).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 11 Mental state: 6. ZDS, endpoint, (short term, high score=worse)

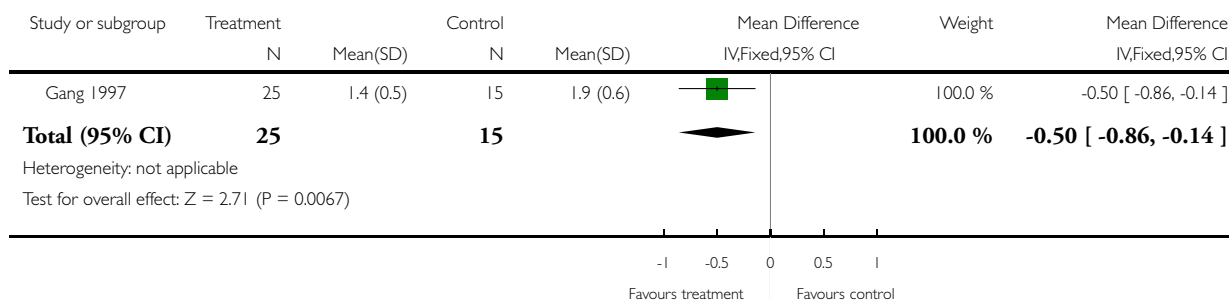


**Analysis 2.12. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 12 Adverse events: 1. TESS, endpoint (short term, high score=worse).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 12 Adverse events: 1. TESS, endpoint (short term, high score=worse)

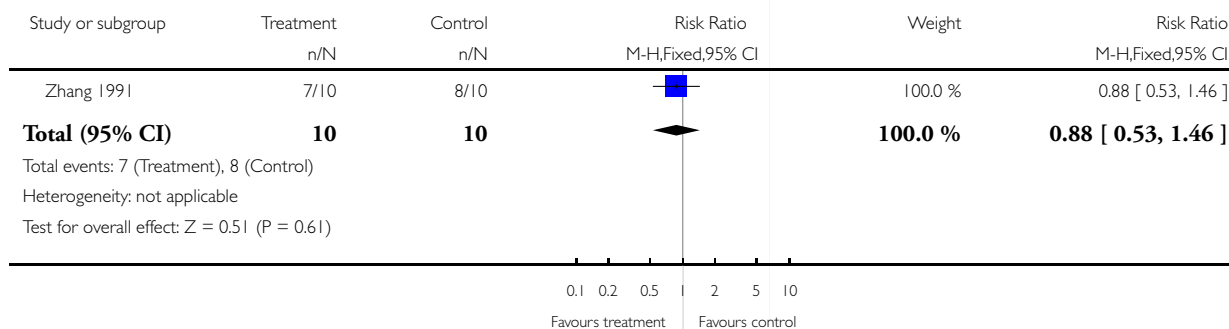


**Analysis 2.13. Comparison 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS, Outcome 13 Adverse events: 2. Extrapyramidal symptoms (short term).**

Review: Acupuncture for schizophrenia

Comparison: 2 ACUPUNCTURE plus ANTIPSYCHOTICS versus ANTIPSYCHOTICS

Outcome: 13 Adverse events: 2. Extrapyramidal symptoms (short term)



## WHAT'S NEW

Last assessed as up-to-date: 4 July 2005.

13 November 2008	Amended	CSG Data Extraction Tag added
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## HISTORY

Protocol first published: Issue 4, 2005

Review first published: Issue 4, 2005

23 April 2008	Amended	Converted to new review format.
5 July 2005	New citation required and conclusions have changed	Substantive amendment

## CONTRIBUTIONS OF AUTHORS

John Rathbone - wrote the protocol, selected studies, data extracted, assimilated data and wrote the final report.

Jun Xia - selected studies, data extracted, translated text and contacted authors.

## DECLARATIONS OF INTEREST

John Rathbone - none known.

Jun Xia - none known.

## INDEX TERMS

### Medical Subject Headings (MeSH)

\*Acupuncture Therapy; Randomized Controlled Trials as Topic; Schizophrenia [\*therapy]

## **MeSH check words**

Humans