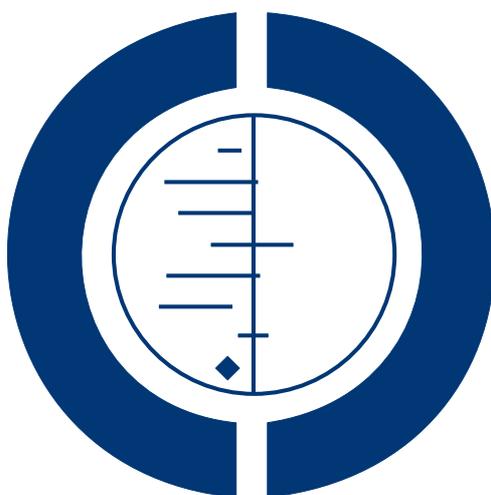


Acupuncture and related interventions for smoking cessation (Review)

White AR, Rampes H, Liu JP, Stead LF, Campbell J



**THE COCHRANE
COLLABORATION®**

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2011, Issue 5

<http://www.thecochranelibrary.com>



TABLE OF CONTENTS

HEADER	1
ABSTRACT	1
PLAIN LANGUAGE SUMMARY	2
BACKGROUND	2
OBJECTIVES	3
METHODS	4
RESULTS	5
Figure 1.	7
Figure 2.	8
Figure 3.	9
DISCUSSION	10
Figure 4.	11
Figure 5.	12
AUTHORS' CONCLUSIONS	13
ACKNOWLEDGEMENTS	14
REFERENCES	14
CHARACTERISTICS OF STUDIES	18
DATA AND ANALYSES	50
Analysis 1.1. Comparison 1 Acupuncture vs waiting list/no intervention, Outcome 1 Smoking cessation - early.	52
Analysis 1.2. Comparison 1 Acupuncture vs waiting list/no intervention, Outcome 2 Smoking cessation - late.	53
Analysis 2.1. Comparison 2 Acupuncture vs sham acupuncture, Outcome 1 Smoking cessation - early.	53
Analysis 2.2. Comparison 2 Acupuncture vs sham acupuncture, Outcome 2 Smoking cessation - late.	54
Analysis 2.3. Comparison 2 Acupuncture vs sham acupuncture, Outcome 3 Including possibly active control interventions - early.	55
Analysis 2.4. Comparison 2 Acupuncture vs sham acupuncture, Outcome 4 Including possibly active control interventions - late.	56
Analysis 3.1. Comparison 3 Acupuncture vs other intervention, Outcome 1 NRT.	57
Analysis 3.2. Comparison 3 Acupuncture vs other intervention, Outcome 2 Counselling and psychological approaches.	58
Analysis 3.3. Comparison 3 Acupuncture vs other intervention, Outcome 3 Interventions of unknown effectiveness.	59
Analysis 4.1. Comparison 4 Comparison between two types of acupuncture, Outcome 1 Smoking cessation - early.	59
Analysis 5.1. Comparison 5 Acupressure vs waiting list/no intervention, Outcome 1 Smoking cessation - early.	60
Analysis 5.2. Comparison 5 Acupressure vs waiting list/no intervention, Outcome 2 Smoking cessation - late.	60
Analysis 6.1. Comparison 6 Acupressure vs sham acupressure, Outcome 1 Smoking cessation - early.	61
Analysis 8.1. Comparison 8 Laser therapy vs sham laser, Outcome 1 Smoking cessation - early.	61
Analysis 8.2. Comparison 8 Laser therapy vs sham laser, Outcome 2 Smoking cessation - late.	62
Analysis 10.1. Comparison 10 Electrostimulation vs sham stimulation, Outcome 1 Smoking cessation - early.	62
Analysis 10.2. Comparison 10 Electrostimulation vs sham stimulation, Outcome 2 Smoking cessation - late.	63
FEEDBACK	63
WHAT'S NEW	65
HISTORY	65
CONTRIBUTIONS OF AUTHORS	66
DECLARATIONS OF INTEREST	66
SOURCES OF SUPPORT	66
DIFFERENCES BETWEEN PROTOCOL AND REVIEW	67
NOTES	67
INDEX TERMS	67

[Intervention Review]

Acupuncture and related interventions for smoking cessation

Adrian R White¹, Hagen Rampes², Jian Ping Liu³, Lindsay F Stead⁴, John Campbell⁵

¹Department of General Practice and Primary Care, Peninsula Medical School, University of Plymouth, Plymouth, UK. ²North East Complex Care Community Mental Health Team, Barnet, Enfield and Haringey Mental Health NHS Trust, Barnet, UK. ³Centre for Evidence-Based Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China. ⁴Department of Primary Health Care, University of Oxford, Oxford, UK. ⁵Department of General Practice and Primary Care, Peninsula Medical School University of Exeter, Exeter, UK

Contact address: Adrian R White, Department of General Practice and Primary Care, Peninsula Medical School, University of Plymouth, 25 Room N32, ITTC Building, Tamar Science Park, Plymouth, PL6 8BX, UK. adrian.white@pms.ac.uk.

Editorial group: Cochrane Tobacco Addiction Group.

Publication status and date: Edited (no change to conclusions), published in Issue 5, 2011.

Review content assessed as up-to-date: 23 November 2010.

Citation: White AR, Rampes H, Liu JP, Stead LF, Campbell J. Acupuncture and related interventions for smoking cessation. *Cochrane Database of Systematic Reviews* 2011, Issue 1. Art. No.: CD000009. DOI: 10.1002/14651858.CD000009.pub3.

Copyright © 2011 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

ABSTRACT

Background

Acupuncture and related techniques are promoted as a treatment for smoking cessation in the belief that they may reduce nicotine withdrawal symptoms.

Objectives

The objectives of this review are to determine the effectiveness of acupuncture and the related interventions of acupressure, laser therapy and electrostimulation in smoking cessation, in comparison with no intervention, sham treatment, or other interventions.

Search strategy

We searched the Cochrane Tobacco Addiction Group specialized register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, BIOSIS Previews, PsycINFO, Science Citation Index, AMED, Acubriefs in November 2010; and four Chinese databases: Chinese Biomedical Database, China National Knowledge Infrastructure, Wanfang Data and VIP in November 2010.

Selection criteria

Randomized trials comparing a form of acupuncture, acupressure, laser therapy or electrostimulation with either no intervention, sham treatment or another intervention for smoking cessation.

Data collection and analysis

We extracted data in duplicate on the type of smokers recruited, the nature of the intervention and control procedures, the outcome measures, method of randomization, and completeness of follow up.

We assessed abstinence from smoking at the earliest time-point (before six weeks), and at the last measurement point between six months and one year. We used the most rigorous definition of abstinence for each trial, and biochemically validated rates if available. Those lost to follow up were counted as continuing smokers. Where appropriate, we performed meta-analysis using a fixed-effect model.

Acupuncture and related interventions for smoking cessation (Review)

Copyright © 2011 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

1

Main results

We included 33 reports of studies. Compared with sham acupuncture, the fixed-effect risk ratio (RR) for the short-term effect of acupuncture was 1.18 (95% confidence interval 1.03 to 1.34), and for the long-term effect was 1.05 (CI 0.82 to 1.35). The studies were not judged to be free from bias. Acupuncture was less effective than nicotine replacement therapy (NRT). There was no evidence that acupuncture is superior to waiting list, nor to psychological interventions in short- or long-term. The evidence on acupressure and laser stimulation was insufficient and could not be combined. The evidence suggested that electrostimulation is not superior to sham electrostimulation.

Authors' conclusions

There is no consistent, bias-free evidence that acupuncture, acupressure, laser therapy or electrostimulation are effective for smoking cessation, but lack of evidence and methodological problems mean that no firm conclusions can be drawn. Further, well designed research into acupuncture, acupressure and laser stimulation is justified since these are popular interventions and safe when correctly applied, though these interventions alone are likely to be less effective than evidence-based interventions.

PLAIN LANGUAGE SUMMARY

Acupuncture and related therapies do not appear to help smokers who are trying to quit.

Acupuncture is a traditional Chinese therapy, generally using needles to stimulate particular points in the body. Acupuncture is used with the aim of reducing the withdrawal symptoms people experience when they try to quit smoking. Related therapies include acupressure, laser therapy and electrical stimulation. The review looked at trials comparing active acupuncture with sham acupuncture (using needles at other places in the body not thought to be useful) or control conditions. The review did not find consistent evidence that active acupuncture or related techniques increased the number of people who could successfully quit smoking. However, acupuncture may be better than doing nothing, at least in the short term; and there is not enough evidence to dismiss the possibility that acupuncture might have an effect greater than placebo.

BACKGROUND

Acupuncture has been used in the treatment of nicotine dependence in the West since an incidental observation in Hong Kong (Wen 1973). Opium smokers who had been given electrical stimulation to acupuncture needles (electroacupuncture) for pain relief reported that their opiate withdrawal symptoms were less severe than they expected. Since then, various techniques of needle or electrostimulation have been used as a treatment for dependence on various addictive substances, with the specific aim of reducing withdrawal symptoms and aiding cessation. For smoking cessation, two basic techniques are used: needles may be inserted for the duration of a treatment session (often lasting 15 to 20 minutes) at the time of cessation. The treatment may be repeated on the following days. Alternatively, or in addition to this intervention, specially designed indwelling needles may be inserted, usually in ear points, and held in position with surgical tape for several days. Patients are instructed to press these indwelling needles when they become aware of withdrawal symptoms. As an alternative to indwelling needles, small seeds or beads may be attached to the ear

with adhesive tape and pressed intermittently (acupressure). Descriptions also exist of the use of a surgical suture which is inserted in the ear and knotted with a bead attached (Man 1975).

Acupuncture research is complicated by different fundamental approaches to acupuncture, and by difficulties in choosing placebo controls. Currently, there are two approaches to explain the effect of acupuncture, which seem incompatible. The differences between them have important implications for research into the needle effect. In the traditional approach, (Traditional Chinese Acupuncture, TCA) the needles are inserted into particular locations where, it is believed, they can correct disturbances of a force called *qi* that (it is believed) underlie the patients' illness. Other locations are not believed to have this special property, and therefore can be readily used as placebo control. This is the theory that underlies most trials of acupuncture. In a more recent approach, known as Western Medical Acupuncture (WMA) the needle effect is believed to be obtained by stimulating nerves or connective tissue (White 2009). Since nerves and connective tissue are found

throughout the body, the effects of the needles are not restricted to particular locations. Therefore, according to the WMA approach, no site can be needled as a placebo control. Moreover, no truly inert placebo for acupuncture needles has yet been devised. Various devices have been introduced that cause less stimulation than needles do, but none of these has been established as a truly inert placebo (Lund 2009; Lundeberg 2008).

Acupuncture needles are usually stimulated by hand when treating most conditions. For smoking cessation, some acupuncturists stimulate the needles electrically with the intention of stimulating more precisely, the release of neurotransmitters that may be involved in suppression of withdrawal symptoms (Clement-Jones 1979). This is electroacupuncture. Others have argued that the needles are unnecessary and it is sufficient to apply the electrical stimulation through surface electrodes attached to the mastoid process or the ear. This form of treatment is variously known as neuroelectrical therapy or (when used on the head) transcranial electrotherapy. This therapy overlaps, and has to a certain extent merged with, a therapy known as Cranial Electrostimulation (CES) which developed separately, mainly in the former Soviet Union and Eastern Europe, as a treatment for insomnia, anxiety and depression. CES has also been used for treatment of alcohol and drug dependence (Klawansky 1995). The electric current is usually sufficient to cause a mild tingling sensation, though sometimes subthreshold currents are used. Here, we combine all such therapies under the heading 'electrostimulation'. It has been argued that the precise placement of electrodes and the parameters of electrostimulation are critical for success (Boutros 1998; Patterson 1993).

As an alternative method of stimulating acupuncture points, some practitioners use pressure alone (acupressure). As with indwelling needles above, the pressure can be sustained by fixing a small ball or bead to the point with adhesive dressing; traditionally, the seed of the cowherb *Semen Vaccariae* was used. Others use low level laser, which is sometimes known as 'laser acupuncture' even though it does not involve needles. Low level laser therapy produces no sensation, and there is still some uncertainty whether it has a physiological effect on normal tissue including nerves, though some data suggest it may have anti-inflammatory effects (Sakurai 2000). From the researcher's point of view, laser therapy has the advantage that both patients and practitioners can remain masked to group allocation by using defunctioned laser apparatus. This also applies to subthreshold electrostimulation therapy.

Uncontrolled studies have suggested that acupuncture reduces the symptoms of nicotine withdrawal and some high rates of initial success have been reported. For example, Fuller 1982 claimed that 95% of 194 subjects were not smoking after three treatments in one week, falling to 34% after twelve months. Choy 1983 claimed 88% success in a large study of 514 subjects but did not state the long-term results. Clearly, only randomized controlled studies can determine whether this is more than a placebo effect.

Several literature reviews of controlled trials of acupuncture for smoking cessation have been published but their conclusions are not uniform. Vincent and Richardson found that acupuncture appeared to be as effective as other methods in the initial stages of nicotine withdrawal. However there was uncertainty as to what the actual stimulation contributed and whether acupuncture helped prevent relapse (Vincent 1987). Schwartz 1988 found no evidence of a specific effect. Brewington 1994 concluded that acupuncture might be of limited assistance in withdrawal.

Ter Riet 1990 performed a criteria-based systematic review of randomized controlled trials and concluded that on balance there was no evidence that acupuncture was efficacious in the treatment of nicotine addiction. Lewith 1995 criticised this review and argued that trials in which the controls received needling in inappropriate sites were likely to underestimate the effects of acupuncture: the control procedure was not inactive, since needling random sites could trigger the release of endorphins. He concluded that acupuncture is as effective as nicotine replacement therapy.

Law and Tang performed a meta-analysis of the trials listed in MEDLINE, concluding that acupuncture had "little or no effect" (Law 1995). Ashenden and Silagy (Ashenden 1997) included ten studies in a systematic review looking at the long-term success of acupuncture in smoking cessation: nine of the studies could be combined in a meta-analysis which concluded that, while acupuncture appeared to be promising, there was insufficient evidence to recommend it as an effective form of therapy. A meta-analysis of 19 studies concluded that acupuncture was more effective than no, or minimal intervention, and sham acupuncture (Castera 2002).

We undertook a review and meta-analysis in order to evaluate the short- and long-term effects of acupuncture, acupressure, laser therapy and electrostimulation for smoking cessation.

OBJECTIVES

Primarily, to evaluate whether acupuncture, acupressure, laser therapy and electrostimulation:

- a) are more effective than waiting list/no intervention for smoking cessation
- b) have a specific effect in smoking cessation beyond placebo effects
- c) are more effective than other interventions used for smoking cessation.

Secondary objective is:

- d) to explore whether any particular acupuncture approach is more effective than any other.

METHODS

Criteria for considering studies for this review

Types of studies

All randomized controlled trials comparing acupuncture, acupressure, laser therapy or electrostimulation with either no intervention, or a sham form of the intervention, or another intervention, for smoking cessation.

Types of participants

Tobacco smokers of any age who wished to stop smoking.

Types of interventions

Non-pharmacological stimulation interventions involving needle puncture, finger pressure or laser therapy in areas of the body described by the study's author as acupuncture points, which includes points on the ear, face and body, or the related intervention of electrostimulation to the head region, either through surface electrodes or through needles. Studies using traditional and western acupuncture approaches will be considered separately.

Types of outcome measures

Complete abstinence from smoking. The review has not been limited to studies where the outcome was confirmed biochemically.

Search methods for identification of studies

We searched the Cochrane Tobacco Addiction Group Specialized Register for trials conducted on any form of acupuncture, acupressure or related laser or electrotherapy (most recent search November 2010). We conducted additional searches of the Cochrane Central Register of Controlled Trials (CENTRAL) (Issue 4, 2010), MEDLINE (Ovid, to 2010 November week 2), EMBASE (Ovid, to 2010 week 46), BIOSIS Previews (Ovid, to 2009 week 42), PsycINFO (Ovid, to November week 3), Science Citation Index (ISI Web of Science updated 20/11/2010) and AMED (Ovid, to November 2010) Medical Acupuncture Research Foundation Acubriefs (last updated September 2007). We last searched the CISCOM database in 2001. In addition, JL searched Chinese databases: CBM (Chinese Biomedical Database), CNKI (China National Knowledge Infrastructure), Wanfang Data and VIP (<http://www.cqvip.com>) in November 2010.

The free text or keyword search strategy was (acupuncture OR acupressure OR transcranial OR transcutaneous OR electric stimulation OR electrostimulation OR electro*acupuncture OR

neuro*electric therapy OR laser therapy) AND (tobacco OR smoking). We included terms other than acupuncture for the first time in 2002 and searches for these terms were retrospective to the earliest date available on all databases. In addition to these searches, we obtained relevant references from published reviews, clinical trials and conference abstracts.

Data collection and analysis

Two authors (from HR, AW, LS) independently extracted data for smoking cessation rates from each report, but JL alone extracted the Chinese reports. We resolved disagreements by discussion. We were not blinded to the study authors or journal title. Where necessary and possible, we contacted authors to provide missing data.

We extracted data (where present in the report) for two time-points: short-term effect, i.e. the first measure after the treatment, up to a maximum of six weeks from the quit date; and long-term effect i.e. the last time-point used up to one year, but with a minimum of six months. The two time-points were selected in an attempt to identify separately the possible effects of the intervention on a) cessation in the acute withdrawal period, and b) sustained abstinence.

Where necessary, we recalculated the published data on an intention-to-treat basis i.e. counting all drop-outs and subjects lost to follow up as continuing smokers. We preferred sustained smoking cessation to point prevalence where these figures were available.

We noted assessment of withdrawal symptoms, but we did not extract data for reported cigarette consumption and concentrations of nicotine breakdown products (carbon monoxide [CO] or cotinine).

The primary analysis included all studies where acupuncture, acupressure, laser therapy or electrostimulation were given alone or as an adjunct to other interventions, as long as the other interventions were given to all groups. Previous versions of this review considered adjunctive acupuncture as a separate group, in case the effect of acupuncture was not measurable because of the other intervention. However, many studies used some level of psychological intervention making it difficult to set a threshold for decision. It seems preferable to combine studies even if the effect of acupuncture might be subsidiary to another intervention and therefore small or even negligible. We considered different acupuncture approaches (needling of body, face, and ear) together for the primary analysis. We compared short- and long-term outcomes for acupuncture, acupressure, laser therapy and electrostimulation individually with different control procedures (i.e. no intervention, sham therapy, and other active treatment control). In each case we calculated a weighted estimate of the risk ratio (RR), with a positive outcome shown as greater than 1, using a Mantel-Haenszel fixed-effect model with 95% confidence intervals (CI). This represents a change from previous versions of this review in which odds ratio and the Peto method was used. Changing the method

for pooling resulted in very small (<0.02) changes in odds ratios or confidence intervals. The Peto method is preferred where events are very rare; although in this review a small number of trials had zero quitters, this reflected their small size rather than uniformly low quit rates. We assessed the amount of statistical heterogeneity between trials using the I^2 statistic (Higgins 2003). Values of 30-60% can be regarded as representing moderate, values of 50-90% as substantial, and values over 75% as considerable heterogeneity. We did not report pooled estimates where heterogeneity was high. Where heterogeneity was moderate we assessed whether the size and significance of the estimated effect was sensitive to the choice of meta-analysis method by testing the effect of pooling using a random-effects model.

We tabulated the results of studies comparing acupuncture with treatments of unknown effect (based on the conclusions of relevant Cochrane Reviews). We tabulated studies that compared two types of acupuncture, without planning to conduct an analysis.

Acupuncture is a highly distinctive intervention; choosing a suitable sham control for acupuncture is essential for patient blinding, but is not easy (White 2001). Two types of sham acupuncture that are commonly used are a) needling an area that is not a recognised 'point', and b) needling a point which is believed to be ineffective for the condition. It is possible that inserting a needle in any location has some general physiological activity relevant to smoking cessation (Lewith 1995). Therefore, the ideal control procedure for acupuncture research would be one that does not involve penetration or stimulation of the skin and yet appears to the participant to be a needle penetrating the skin. Non-penetrating sham needles have been developed, but have not so far been used in research into smoking cessation. For smoking cessation, all studies so far have adopted the usual classical convention that the effects of acupuncture are point-specific, and tested that hypothesis.

However, it has been recognised that the control point that is chosen as an 'ineffective' point might have some specific effect on the condition. For example, in a review of acupuncture for asthma, points that were chosen for control groups in some studies because the researchers considered them to be ineffective for asthma were used by other groups as the active intervention (Jobst 1995). In this review, therefore, in response to earlier comments, we examined the points used as controls in each study and checked these against the active points used in the other studies and in two literature reviews of studies of acupuncture for smoking cessation (Zhang 1992, including 48 studies, and Jiang 1994, including 64 studies). Our principal analysis included only those studies with control points that are not used in other studies of smoking cessation. We then performed a further analysis of all studies, i.e. including those in which the control group may have received active treatment.

Risk of bias

We assessed the risk of bias in each study using the methods of the current Cochrane Handbook. This involves consideration of the adequacy of sequence generation, allocation concealment, blinding (we assessed participant blinding for acupuncture/placebo

acupuncture comparisons, and assumed blinding when the two interventions were designed to appear identical even if the word 'blind' is not stated: we assumed all other comparisons were not blinded). For judging whether incomplete outcome data have been addressed, we classified studies as being at low risk of bias for this item if there was a clear description of numbers randomised and lost to follow up in each treatment group, and numbers lost were not high and were not substantially different between groups. Following the recommended methodology for Cochrane Tobacco Addiction group reviews, we assumed that all randomised participants who withdrew or were lost to follow up were smoking. If numbers lost to follow up were substantially different between groups, so that the relative effect was sensitive to the inclusion or exclusion of dropouts, we classified the risk of bias as uncertain. If losses to follow up seemed to have been ignored so that it was not possible to construct an intention to treat analysis with drop-outs as smokers the risk of bias was regarded as high.

Selective reporting: we did not include this item, since we only extracted data on smoking cessation.

In judging whether the study is free from other bias, we mainly considered baseline differences in possible response predictors, such as duration of smoking and number of previous attempts to quit. We then combined the judgements on freedom from bias into a table to comment on the risk of bias of the studies.

We included all studies in the analysis, regardless of the risk of bias, since this is uncertain for a high proportion of studies. We planned to interpret any positive findings by conducting a subgroup analysis of only those studies with low risk of bias.

RESULTS

Description of studies

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

We found 33 reports of studies which qualified for inclusion in the review, including three in abstract form Antoniou 2005; Docherty 2003; Scheuer 2005. Two were published in Chinese Han 2006; Li 2009, five only in French Labadie 1983; Lacroix 1977; Lagrue 1980; Vandevienne 1985; Vibes 1977, one in Italian Circo 1985 and the remainder in English.

Two studies reported short- and long-term results in separate papers (Clavel 1992; He 1997). The reports by Martin 1981a and by Parker 1977a each described a four-arm trial which amounted to two parallel studies, i.e. two different intervention groups each with its own control group. In each case, we considered these as two separate studies. We were unable to interpret the data from one study (Bier 2002) which reported a significant superiority in the quit rate after the combination of education and acupuncture when compared with acupuncture alone or education alone.

However there are inconsistencies in the data as presented which were not clarified by contact with the authors, and therefore it was not possible to extract reliable data from this study for the meta-analysis.

All studies were straightforward parallel arm design except two which were of factorial design. Clavel 1992 evaluated nicotine replacement therapy (NRT) and acupuncture simultaneously in a 2x2 design. For the comparison of acupuncture with sham acupuncture, these data were interpreted as two separate comparisons, combined with real or placebo NRT. For the comparison of acupuncture with NRT, acupuncture plus placebo NRT was compared with sham acupuncture plus NRT. Georgiou 1999 evaluated two modes of electrical stimulus, two locations and active/sham stimulation simultaneously in a 2x2x2 design: data for the two active groups (active stimulation at active location, using either modulated or continuous mode) were combined and compared with the combined data from all control groups.

Research in this area has been conducted over a long period. Four studies were published in the 1970s (Gilbey 1977; Lacroix 1977; Parker 1977a; Vibes 1977), ten in the 1980s (Circo 1985; Clavel 1985; Cottraux 1983; Gillams 1984; Labadie 1983; Lagrue 1980; Lamontagne 1980; Martin 1981a; Steiner 1982; Vandevenne 1985), eight in the 1990s and eleven since 2000.

Initial group sizes for Kerr 2008, Martin 1981a and Vibes 1977 were not available in the published reports and data were obtained from the authors. Results for the different arms of Clavel 1992 were obtained from the authors.

Interventions

All studies used a traditional approach to acupuncture, choosing points nominated as specific for smoking cessation. Five studies used facial acupuncture (Clavel 1985; Clavel 1992; Cottraux 1983; Lacroix 1977; Lagrue 1980). Eleven studies used auricular acupuncture alone (Circo 1985; Gilbey 1977; Gillams 1984; Lamontagne 1980; Leung 1991; Martin 1981a; Parker 1977a; Parker 1977b; Waite 1998; White 1998; Wu 2007). All but three of these (Lamontagne 1980; Parker 1977b; White 1998) used some form of continuous stimulation, either needle or pressure device. Seven studies combined body and auricular acupuncture (Bier 2002; Han 2006; He 1997; Labadie 1983; Martin 1981b; Steiner 1982; Vandevenne 1985) of which two (He 1997; Martin 1981b) also used indwelling needles. Vibes 1977 used facial, body, and indwelling auricular acupuncture in different groups. This review's primary analysis included all forms of acupuncture (see Methods above).

The following studies used interventions related to acupuncture: Li 2009, Tian 1996 and White 2007 used acupressure, Cai 2000, Docherty 2003 and Kerr 2008 used laser, and Georgiou 1999, Pickworth 1997 and Scheuer 2005 investigated electrostimulation given over the mastoid bone while Antoniou 2005 and Yeh 2009 gave electrostimulation to the ear (Yeh 2009 also used acupres-

sure; we classified it by what we considered the main intervention, electrostimulation)

Control interventions

All studies used a Traditional Chinese Acupuncture approach in regarding the location of stimulation as significant and regarding non-acupuncture points as a control intervention. Four studies used points for the control group that were intended by the authors to be inactive but could be considered, in the traditional approach, to be active (see Methods). These were excluded in the main analysis. Gilbey 1977 used the auricular point 'Kidney' in the control group, which is reported in a review as used for smoking cessation (Zhang 1992). He 1997 used the point LI10 in the control group, which was used in treatment by another study (Jiang 1994). Lamontagne 1980 used body points including ST36 for relaxation as a control. The point ST36 is reported as an active treatment in the review by Zhang, and in one of the studies in this review (Vibes 1977). The control group in one arm of Martin 1981a received acupuncture at LI4 which was used as part of active treatment in three other studies (Labadie 1983; Steiner 1982; Vibes 1977).

Patients in four control arms were given interventions that are of unknown effect. Circo 1985 compared acupuncture to medical treatment with vitamins and a herbal medicine, extract of hawthorn; Clavel 1992 compared acupuncture with a locked cigarette case controlled by a time-switch; Cottraux 1983 compared acupuncture with placebo capsules; and Labadie 1983 compared acupuncture with 'medical treatment' consisting of advice, a benzodiazepine drug, lobeline and a 'detoxicant'.

Four studies comprised more than one control group and therefore qualify for entry into more than one comparison table: Cottraux 1983 compared acupuncture with a counselling and psychological approach, with waiting list and with placebo capsules; Gillams 1984 compared acupuncture with sham acupuncture and with group therapy; Lamontagne 1980 compared acupuncture with sham body acupuncture and with a no-treatment control arm; and Leung 1991 compared acupuncture with behaviour therapy and with waiting-list control.

Han 2006 and Vibes 1977 compared different acupuncture approaches with each other.

Risk of bias in included studies

The risk of bias was judged unclear in many studies because of lack of detail in the reports, mainly associated with the facts that the older studies were published before current standards of reporting were widely applied, and several studies were published only as abstracts. In particular, methods of randomisation and allocation concealment could often not be assessed, and baseline comparisons between groups were often not reported. Apart from the lack of subject blinding in open studies, there was judged to be some risk

of bias in six studies (Antoniou 2005; Gilbey 1977; Kerr 2008; Labadie 1983; Lagrue 1980; White 2007).

interval [CI] 0.98 to 3.28, Analysis 1.2), and there was evidence of moderate heterogeneity ($I^2 = 57\%$).

Effects of interventions

Acupuncture compared with waiting list/no intervention

For short-term outcomes, the results of two studies showed substantial statistical heterogeneity ($I^2 = 84\%$) and therefore were not combined. Both studies used auricular acupuncture, but one used sustained treatment with indwelling studs (Leung 1991) and the other used auricular needling during treatment sessions only (Lamontagne 1980). The first, using sustained treatment, was positive whereas the second was negative, which suggests that some of the heterogeneity may be explained by clinical diversity (Analysis 1.1).

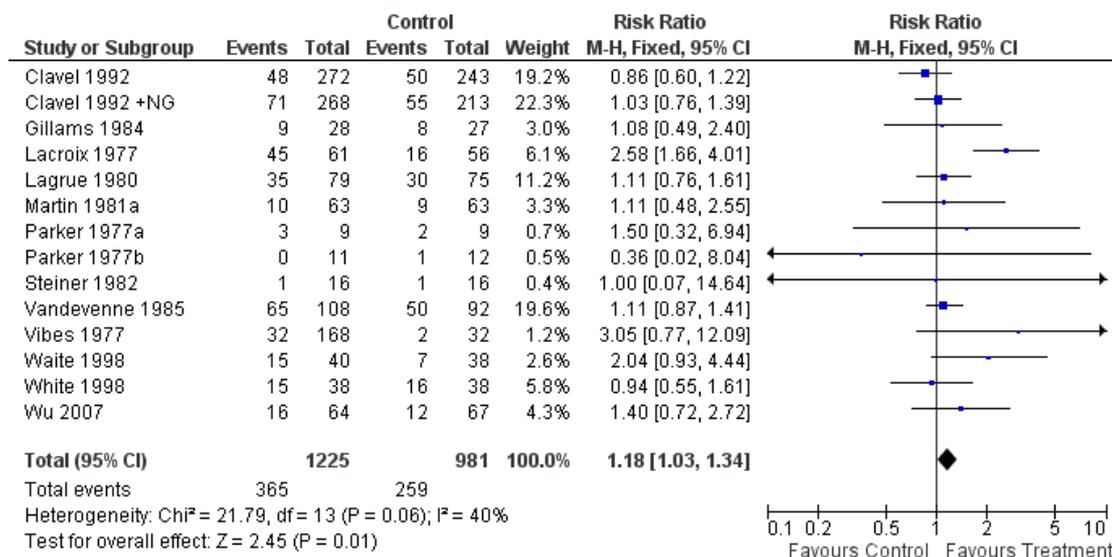
Three studies provided long-term outcome data (6 to 12 months). Combining these results does not demonstrate a significant effect of acupuncture (N = 393; risk ratio [RR] 1.79, 95% confidence

Acupuncture compared with sham acupuncture

Short-term outcomes

The 12 studies (14 comparisons) which measured short-term outcome of acupuncture compared with sham acupuncture (excluding the four studies with active points in the control group) combine to give an overall positive result (RR 1.18, 95% CI 1.03 to 1.34) with moderate heterogeneity ($I^2 = 40\%$) (Figure 1, Analysis 2.1). We did not conduct a subgroup analysis of high quality studies since no study was judged to be free of bias. One individual study (Lacroix 1977) of moderate size showed a significant effect (RR 2.58, 95% CI 1.66 to 4.01). We cannot identify any particular clinical or methodological features that might explain why this study alone is positive, although we note that the baseline characteristics of the groups are not reported so we cannot exclude confounding of the results by inequality between the groups in predictor variables.

Figure 1. Acupuncture vs sham acupuncture, early smoking cessation



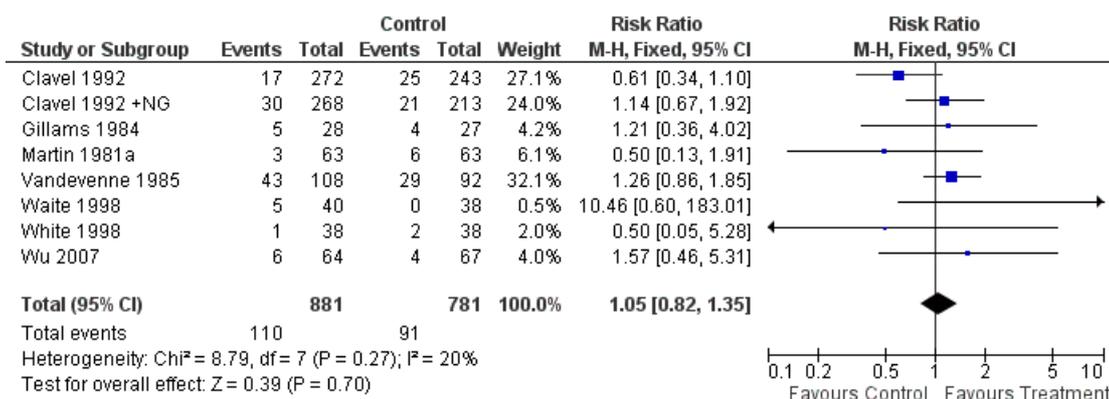
A further analysis of all 18 comparisons of acupuncture with sham acupuncture, including those four studies that used possibly active controls, produces a very similar RR of 1.18, 95% CI 1.04 to 1.33, (Analysis 2.3), with little or moderate heterogeneity ($I^2 = 34\%$).

This suggests that the theoretical methodological problem of possibly active control interventions has little effect on the outcome in practice.

Late outcomes

The six studies with late (6 to 12 month) outcomes do not show any relative effect of acupuncture compared with sham (RR 1.05, 95% CI 0.82 to 1.35, [Figure 2, Analysis 2.2](#)), with little evidence of heterogeneity ($I^2 = 20\%$). As before, the subgroup that included possibly active controls had a similar pooled estimate ([Analysis 2.4](#)).

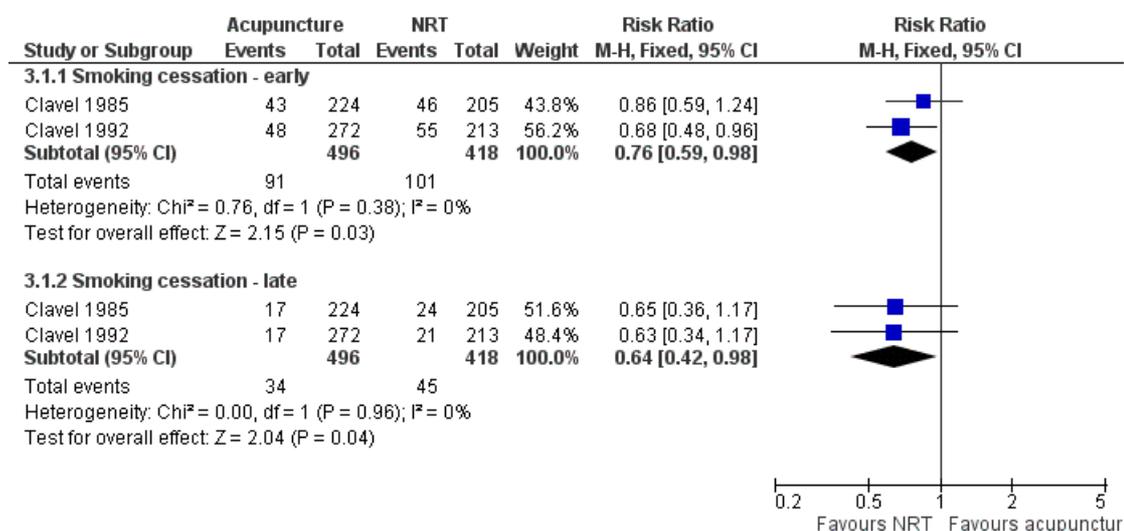
Figure 2. Acupuncture vs sham acupuncture, smoking cessation at 6-12 months



Acupuncture compared with other interventions

Acupuncture was less effective than NRT ([Analysis 3.1, Figure 3](#)) both in the short term (RR 0.76, CI 0.59, 0.98) and in the long term (RR 0.64, CI 0.42, 0.98) with no heterogeneity. Acupuncture showed no difference of effect from counselling and psychological approaches (three studies, [Analysis 3.2](#)) at either the short or long term time point.

Figure 3. Acupuncture vs NRT



There were four trials of acupuncture compared with interventions of unknown effect (Analysis 3.3). In a large trial that was judged to be at risk of bias, acupuncture proved superior to a time-locked cigarette case (Clavel 1985) in both short term and long term. Acupuncture was superior to placebo capsules at end of treatment, though not in the long term (Cottraux 1983). Acupuncture was not different in effect from the use of illustration material (Circo 1985) or a combination medication product (Labadie 1983). In the studies comparing different types of acupuncture (Table 1), body acupuncture in addition to auricular acupuncture was not more effective than auricular acupuncture alone (Han 2006) but acupuncture to the Zero point in the ear and classical body acupuncture appeared more effective than other approaches, but were not statistically compared (Vibes 1977).

Table 1. Comparisons of different forms of acupuncture

Study	Type of acupuncture	N included	Not smoking (early)	Success rate
Han 2006				
	body points only	22	16	73%
	body and auricular points	20	11	55%
Vibes 1977				
	classical (body) points	44	14	32%
	Zero point (ear)	39	11	28%

Table 1. Comparisons of different forms of acupuncture (Continued)

Lung point (ear)	34	3	9%
nose points	48	4	8%
sham control (hands/feet)	30	2	7%

Acupressure

Two studies compared acupressure with usual care or advice alone in the short term (Analysis 5.1). Their results show considerable heterogeneity ($I^2 = 91\%$) so we did not combine them. One was a large definitive trial using four ear points, and was positive in both short and long term (Tian 1996). The second was a small pilot study using one or two ear points, and showed no effect (White 2007) at short term, with no long-term outcome. Comparing acupressure with sham, a single study by Li 2009 found acupressure to the correct points was more effective than acupressure to points deemed ineffective (Analysis 6.1). Two other studies (He 1997; Waite 1998) used acupressure in combination with acupuncture or electroacupuncture and are included in previous analyses. We found no study comparing acupressure with other smoking cessation interventions.

Laser therapy

There are no comparisons of laser either with waiting list or with other interventions for smoking cessation. Two reports of studies comparing laser with sham laser showed considerable heterogeneity in their results ($I^2 = 97\%$) and were not combined (Analysis 8.2). The heterogeneity may be due, at least partly, to diversity in the participants and dose of laser, and is discussed below.

Electrostimulation

There are no comparisons of electrostimulation with waiting list or with other interventions for smoking cessation. Electrostimulation was not more effective than sham electrostimulation either in the short term (RR 1.17, 95% CI 0.89 to 1.54, Analysis 10.1) or the long term (RR 0.87, 95% CI 0.61 to 1.23, Analysis 10.2).

DISCUSSION

There is a lack of studies on acupuncture and related interventions for smoking cessation with large sample sizes and low risk of bias. We shall discuss the evidence in relation to both effectiveness (the

overall effect including 'placebo' effects, tested by comparing with waiting list, and comparison with other intervention) and efficacy (comparing with sham) for each of the four related interventions, before general comments about possible mechanisms of action and difficulties in this research area.

We found inconsistent evidence on whether acupuncture is effective overall for smoking cessation when compared with no intervention, in open studies, although the study results are heterogeneous. The acupuncture methods used in the studies were dissimilar but not sufficiently different to explain the heterogeneity convincingly: positive results were associated with the use of indwelling needles (Leung 1991) and with three weekly treatment sessions Cottraux 1983. We found no evidence that acupuncture was more (or less) effective than other active interventions used for smoking cessation. The combined results of two large studies (Clavel 1985, Clavel 1992) found acupuncture less effective than nicotine replacement therapy (NRT), though neither study is free of bias, and in the first, the acupuncture was given on only one occasion and so may have been inadequate (see below).

We found evidence of the efficacy of acupuncture compared with sham acupuncture immediately after the intervention (Figure 1) with a RR of 1.2, though the efficacy was not evident at the long term follow up (Figure 2). This evidence appears to suggest that acupuncture may have physiological effects relevant to smoking cessation, but it would be more convincing if a) the effect were sustained, and if the evidence b) were free of bias, and c) showed consistency or at least heterogeneity that could be explained. The strength of the evidence is that it includes 14 comparisons and 2206 smokers from a wide range of countries and settings; and it is likely to be reasonably complete since the funnel plot (Figure 4) shows no evidence of publication bias that might be caused by the absence of small, negative studies. The limitations of the evidence are as follows. a) The eight studies with long-term follow up showed no effect. The one positive study (Lacroix 1977) had no long-term follow up. b) No study was judged to be free of the risk of bias (Figure 5). The two studies with least risk of bias were negative (Clavel 1992, White 1998), and the one positive study had unknown risk of bias for four out of five items (Figure 5). c) Inspection of the forest plot (Figure 1) does not give the overall

impression of evidence of an effect, and the positive combined result is highly dependent on just one clearly positive study (Lacroix 1977). Considering the results of the nine larger studies with over 100 participants, four studies with 526 smokers had results to the right of the combined RR (positive) and five, with 1476 smokers, had results to the left. In the one study (Lacroix 1977) whose confidence intervals do not overlap the point of no effect, facial acupuncture was applied three times at weekly intervals. One other study (Lagrue 1980) found no effect of two sessions of the same acupuncture approach; and another (Vibes 1977) found less effect

with a similar approach than with auricular acupuncture, though group size was small. The other studies with results lying to the right of the combined risk ratio used different acupuncture approaches: Vibes 1977 found body and auricular acupuncture more effective than other approaches (additional Table 1); Waite 1998 used a single session of auricular stimulation followed by acupresure; and Wu 2007 used indwelling auricular needles for eight weeks. Thus, the evidence does not point convincingly towards one approach being more effective than others, and the different approaches do not explain the heterogeneity in Figure 2.

Figure 4. Funnel plot of comparison: 2 Acupuncture vs sham acupuncture, early outcome

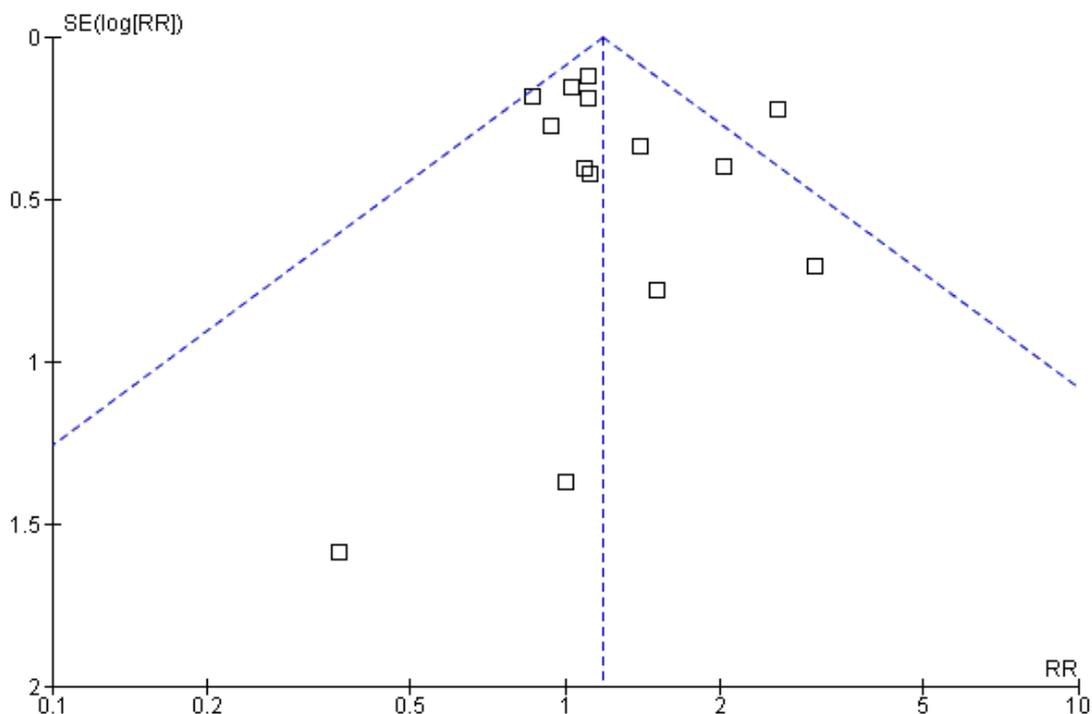


Figure 5. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding (performance bias and detection bias)	Incomplete outcome data (attrition bias)	Other bias
Antoniou 2005	?	?	?	?	?
Bier 2002	+	?	+	?	+
Cai 2000	?	?	+	+	+
Circo 1985	?	?	+	+	?
Clavel 1985	?	?	?	?	+
Clavel 1992	?	?	+	?	?
Clavel 1992 +NG	?	?	+	?	?
Cottraux 1983	?	?	+	?	+
Docherty 2003	?	?	+	?	?
Georgiou 1999	+	?	+	+	?
Gilbey 1977	?	?	+	?	+
Gillams 1984	+	+	+	+	?
Han 2006	?	?	?	+	?
He 1997	+	?	+	+	+
Kerr 2008	+	+	+	+	?
Labadie 1983	+	+	+	+	?
Lacroix 1977	?	?	+	?	?
Lagrué 1980	+	+	+	+	?
Lamontagne 1980	?	?	+	+	?
Leung 1991	?	?	+	?	+
Li 2009	?	?	?	+	?
Martin 1981a	?	?	+	?	+
Martin 1981b	?	?	+	?	+
Parker 1977a	?	?	+	+	?
Parker 1977b	?	?	+	+	?
Pickworth 1997	?	+	+	+	+
Scheuer 2005	?	?	+	?	?
Steiner 1982	?	+	+	?	+
Tian 1996	?	?	+	?	+
Vandevenne 1985	+	?	+	?	+
Vibes 1977	?	?	+	+	?
Walte 1998	?	?	+	+	+
White 1998	+	+	+	?	+
White 2007	+	+	+	+	+
Wu 2007	?	?	+	+	+
Yeh 2009	?	?	+	?	+

For acupressure, we found conflicting evidence on acupressure compared with advice alone: one larger study was positive (Tian 1996) though with uncertain quality, and the negative study was a small pilot study (White 2007) not designed to test the effectiveness. One study showed that acupressure was superior to sham acupressure, though of uncertain risk of bias (Li 2009). Thus we conclude that the evidence is insufficient to make conclusions that would change practice, but sufficient to justify further studies.

For laser stimulation, our search found two new studies, one of which (Kerr 2008) is strongly positive at both short and long term. Its results are inconsistent with the other two studies which show no trend. This heterogeneity may be explained by two factors. The studies differed in participants: Cai 2000 included adolescents smoking as little as 5 cigarettes a day, Docherty 2003 recruited adults from a socioeconomically deprived area, and Kerr 2008 included adults with no restriction. They also differed in dose of laser: Cai 2000 used 4 minutes at 3mW, whereas Kerr 2008 used 14 minutes at 50mW which is considerably higher; the dose used by Docherty 2003 is not reported in the abstract. On this evidence, the effectiveness of laser stimulation for smoking cessation justifies further investigation.

For electrostimulation, two newly included RCTs (Scheuer 2005, Antoniou 2005) provide support for the existing short term studies, but adding no evidence of long-term effect. This evidence gives added confidence that electroacupuncture, used in the locations and regimes tested here, does not have any effect beyond placebo for smoking cessation.

Overall there is not sufficient evidence to rule out an effect of acupuncture, acupressure and laser stimulation on smoking cessation. We should consider their possible mechanism of action in relation to justifying further research. According to current theory, these interventions stimulate peripheral nerves to generate relevant effects in the central nervous system. Animal experiments have suggested that acupuncture might have effects on the acute withdrawal syndrome (Cheng 1980; Choy 1978; Han 1993; Ng 1975). In a classic paper, opioid peptides were released during the acute administration of acupuncture in association with relief of withdrawal symptoms in humans (Clement-Jones 1979). Acupuncture can modify the nicotine-induced locomotor activity and neural activity in the nucleus accumbens (Chae 2004), which is known to be a site that is crucial for chemical dependence. Other studies suggest that acupuncture may modulate dopamine release via the GABA mechanism (Yoon 2004; Yoon 2010): though other groups found evidence of enkephalin release (Liang 2010) which accumulates on repeated stimulation over three consecutive days; and yet other groups report serotonin (5-hydroxytryptamine) release (Yoshimoto 2006). Brain imaging studies of acupuncture have generally focussed on the limbic system in relation to pain control, though one study described fMRI (functional magnetic resonance) changes in the nucleus accumbens (Hui 2005).

While we await confirmation of these possible mechanisms and investigation of their clinical relevance (if any), they do imply that any effect of acupuncture is likely to be via release of relevant neurotransmitters. This suggests that the duration of effect is likely to be no more than 24 hours and possibly considerably less. This has implications for both practice and research in this area.

Controlled trials of acupuncture are challenging in several ways, particularly defining adequate active interventions and inactive controls, and blinding participants. Clinical experience from the earliest observations in drug dependence suggests that adequate treatment involves frequent repetition - at least once a day - for withdrawal from opioid drugs (Smith 1988; Wen 1973). From our understanding of the possible mechanisms of action, adequate dosage with acupuncture for smoking cessation would include either several applications or a continuous stimulation. However, the evidence from the studies in this review does not give consistent support for the most effective form of intervention, presumably because the studies differ in other ways. Many studies used three weekly sessions, or indwelling needles over at least two weeks over the period of planned smoking cessation. Defining inactive controls for acupuncture is a perennial problem, since blinding of participants would seem to necessitate some form of needling. But if the neurochemical release discussed above is a general effect of acupuncture-like stimulation at any location (Lewith 1995), then any needle insertion in the control group is likely to be active, even if it is in a point that might be described by classically trained acupuncturists as 'not relevant for this indication'. Blunt, non-penetrating needles have been used in research into pain control, but not yet in smoking cessation. It is challenging that, in view of the relatively small effect of acupuncture on smoking cessation, comparisons of different techniques and different controls would require large sample sizes.

Non-pharmaceutical interventions such as those included in this review are popular and safe in the hands of trained practitioners provided that relevant precautions are taken to avoid infection. Economic data were not considered in this review, but some of the techniques related to acupuncture may have the potential to compete economically with other methods of smoking cessation such as pharmaceutical products and psychological interventions.

AUTHORS' CONCLUSIONS

Implications for practice

There is no bias-free, consistent evidence that acupuncture, acupressure, laser therapy or electrostimulation are effective interventions for smoking cessation. Acupuncture is less effective than nicotine chewing gum.

Implications for research

The current evidence justifies further studies of acupuncture, acupressure and laser stimulation for smoking cessation provided that the intervention is given in adequate dosage for a sufficient period of time and compared with either no treatment, or another active intervention, or (for efficacy studies) a form of intervention that is likely to be inactive. It is relevant to continue research into acupuncture and related interventions for smoking cessation since they are popular and safe when correctly applied; however, acupuncture alone is likely to be less effective than evidence-based interventions such as NRT. Studies could also consider economic evaluation, and the potential different roles of acupuncture used as part of a stages-of-change based approach.

ACKNOWLEDGEMENTS

We are grateful to Ruth Ashenden and Chris Silagy for kindly giving us access to their own review of acupuncture in smoking cessation as the basis for much of the original version of this review.

We are grateful to Prof P Waite of the University of New South Wales, Australia, for providing further data for the [Martin 1981a](#) study; and to Dr F Clavel of the Unite de Recherche en Epidemiologie des Cancers, Villejuif France for providing data for the [Clavel 1990](#) study.

We are grateful to Jie Shen, Yi-Man Au, and Jongbae Park for translating a study report from the original Chinese ([Fang 1983](#)).

We are grateful to Johan Nguyen for perceptive comments on this and an earlier version of this review, for providing one trial report of which we were not aware ([Vibes 1977](#)) and for contacting that author to obtain baseline group sizes.

REFERENCES

References to studies included in this review

Antoniou 2005 {unpublished data only}

Antoniou D, Bouros D, Pavlakou G, Chaimala D, Papageorgiou C, Beltegris, et al. Aural electrical stimulation for smoking cessation - a double blind, placebo controlled study [abstract]. *European Respiratory Journal* 2005;**26**(Suppl 49):388s.

Bier 2002 {published data only}

Bier ID, Wilson J, Studt P, Shakleton M. Auricular acupuncture, education, and smoking cessation: a randomized, sham-controlled trial. *American Journal of Public Health* 2002;**92**(10):1642-7.

Cai 2000 {published data only}

Cai Y, Zhao C, Wong SU, Zhang L, Lim SK. Laser acupuncture for adolescent smokers - a randomized double-blind controlled trial. *American Journal of Chinese Medicine* 2000;**25**(3-4):443-9.

Circo 1985 {published data only}

Circo A, Tosto A, Raciti S, Cardillo R, Gulizia M, Oliveri M, et al. First results of an anti-smoke outpatient unit: Comparison among three methods [Primi risultati di un ambulatori antifumo. Confronto fra tre metodice]. *Rivista di Cardiologia Preventiva e Riabilitativa* 1985;**3**(2):147-51.

Clavel 1985 {published data only}

Clavel F, Benhamou S. Tobacco withdrawal. Comparison of the efficacy of various methods. Intermediate results of a comparative study [Desintoxication tabagique. Comparaison de l'efficacite de differentes methodes. Resultats intermediaires d'une etude comparative]. *Presse Medicale* 1984;**13**(16):975-7.

* Clavel F, Benhamou S, Company-Huertas A, Flamant R. Helping people to stop smoking: randomised comparison of groups being treated with acupuncture and nicotine gum with control group. *British Medical Journal Clinical Research Edition* 1985;**291**:1538-9.

Clavel 1992 {published and unpublished data}

Clavel-Chapelon F, Paoletti C, Benhamou S. Smoking cessation rates 4 years after treatment by nicotine gum and acupuncture. *Preventive Medicine* 1997;**26**:25-8.

Clavel F, Paoletti C. [Une étude de différents programmes de désintoxication tabagique portant sur près de 1000 volontaires recrutés dans la population générale : résultats à 1 mois]. *Revue d'Epidemiologie et de Sante Publique* 1990;**38**:133-8.

* Clavel F, Paoletti C, Benhamou S. A randomised 2x2 factorial design to evaluate different smoking cessation methods. *Revue d'Epidemiologie et de Sante Publique* 1992;**40**:187-90.

Clavel 1992 +NG {published data only}

Clavel-Chapelon F, Paoletti C, Benhamou S. Smoking cessation rates 4 years after treatment by nicotine gum and acupuncture. *Preventive Medicine* 1997;**26**:25-8.

* Clavel F, Paoletti C, Benhamou S. A randomised 2x2 factorial design to evaluate different smoking cessation methods. *Revue d'Epidemiologie et de Sante Publique* 1992;**40**(3):187-90.

Cottraux 1983 {published data only}

Cottraux J, Schbath J, Messy P, Mollard E, Juenet C, Collet L. Predictive value of MMPI scales on smoking cessation programs outcomes. *Acta Psychiatrica Belgiques* 1986;**86**:463-9.

* Cottraux JA, Harf R, Boissel JP, Schbath J, Bouvard M, Gillet J. Smoking cessation with behaviour therapy or acupuncture - a controlled study. *Behaviour Research and Therapy* 1983;**21**(4):417-24.

Docherty 2003 {unpublished data only}

Docherty G, Gordon D, McAlpine L. Laser and NRT smoking cessation programmes in areas of high social deprivation [Abstract]. *Thorax* 2003;**58**(Suppl 3):iii43.

Georgiou 1999 {published data only}

Georgiou AJ, Spencer CP, Davies GK, Stamp J. Electrical stimulation therapy in the treatment of cigarette smoking. *Journal*

- of Substance Abuse* 1998;**10**:265–74.
- Gilbey 1977** *{published data only}*
 Gilbey V, Neumann B. Auricular acupuncture for smoking withdrawal. *American Journal of Acupuncture* 1977;**5**:239–47.
- Gillams 1984** *{published data only}*
 Gillams J, Lewith GT, Machin D. Acupuncture and group therapy in stopping smoking. *Practitioner* 1984;**228**:341–4.
- Han 2006** *{published data only}*
 Han Y. Combining of acupuncture and auricular points applying for treatment of 42 cases of tobacco withdrawal syndrome. *Journal of Clinical Acupuncture and Moxibustion* 2006;**22**(11):16.
- He 1997** *{published data only}*
 He D, Berg JE, Hostmark AT. Effects of acupuncture on smoking cessation or reduction for motivated smokers. *Preventive Medicine* 1997;**26**:208–14.
 He D, Medbo JI, Hostmark AT. Effect of acupuncture on smoking cessation or reduction: an 8-month and 5-year follow-up study. *Preventive Medicine* 2001;**33**(5):364–72.
- Kerr 2008** *{published and unpublished data}*
 Kerr CM, Lowe PB, Spielholz NI. Low level laser for the stimulation of acupoints for smoking cessation: A double blind, placebo controlled randomised trial and semi structured interviews. *Journal of Chinese Medicine* 2008, (86):46–51.
- Labadie 1983** *{published data only}*
 Labadie JC, Dones JP, Gachie JP, Fréour P, Perchoc S, et al. [Désintoxication tabagique: acupuncture et traitement médical]. *Gazette Medicale de France* 1983;**90**:2741–7.
- Lacroix 1977** *{published data only}*
 Lacroix JC, Besancon F. [Le sevrage du tabac. Efficacité de l'acupuncture dans un essai comparatif]. *Annales Medicales Internes Paris* 1977;**128**:405–8.
- Lagrué 1980** *{published data only}*
 Lagrué G, Poupy JL, Grillot A, Ansquer JC. Antismoking acupuncture. Short-term results of a double-blind comparative study [Acupuncture anti-tabagique. Resultats a court terme d'une etude comparative menee a double insu]. *Nouvelle Presse Medicale* 1980;**9**:966.
- Lamontagne 1980** *{published data only}*
 Lamontagne Y, Annable L, Gagnon MA. Acupuncture for smokers: lack of long-term therapeutic effect in a controlled study. *Canadian Medical Association Journal* 1980;**5**:787–90.
- Leung 1991** *{published data only}*
 Leung JP. Smoking cessation by auricular acupuncture and behavioral therapy. *Psychologia* 1991;**34**:177–87.
- Li 2009** *{published data only}*
 Li Y, Shen T, Cao L, et al. Clinical research of the seed of cowherb auricular pressing in treating 70 cases of quitting smoking. *Jilin Journal of Traditional Chinese Medicine* 2009;**29**(6):505–6.
- Martin 1981a** *{published data only}*
 Martin GP, Waite PME. The efficacy of acupuncture as an aid to stopping smoking. *New Zealand Medical Journal* 1981;**93**:421–3.
- Martin 1981b** *{published data only}*
 Martin GP, Waite PME. The efficacy of acupuncture as an aid to stopping smoking. *New Zealand Medical Journal* 1981;**93**:421–3.
- Parker 1977a** *{published data only}*
 Parker LN, Mok MS. The use of acupuncture for smoking withdrawal. *American Journal of Acupuncture* 1977;**5**:363–6.
- Parker 1977b** *{published data only}*
 Parker LN, Mok MS. The use of acupuncture for smoking withdrawal. *American Journal of Acupuncture* 1977;**5**:363–6.
- Pickworth 1997** *{published data only}*
 Pickworth W, Fant R, Goffman A, Henningfield J. Cranial electrostimulation therapy: Response. *Biological Psychiatry* 1998;**43**:468–9.
 * Pickworth W, Fant R, Goffman A, Henningfield J. Evaluation of cranial electrostimulation therapy on short-term smoking cessation. *Biological Psychiatry* 1997;**42**:116–21.
- Scheuer 2005** *{unpublished data only}*
 Scheuer E. Effectiveness of neuroelectric therapy in inducing smoking cessation. *Nicotine & Tobacco Research* 2005;**7**(4):648–9.
- Steiner 1982** *{published data only}*
 Steiner RP, Hay DL, Davis AW. Acupuncture therapy for the treatment of tobacco smoking addiction. *American Journal of Chinese Medicine* 1982;**10**:107–21.
- Tian 1996** *{published data only}*
 * Tian Z, Chu Y. Treating smoking addiction with the ear point seed pressing method. *Journal of Chinese Medicine* 1996;**52**:5–6.
- Vandevenne 1985** *{published data only}*
 Vandevenne A, Rempp M, Burghard G. Study of the specific contribution of acupuncture to tobacco detoxication [Etude de l'action spécifique de l'acupuncture dans la cure de sevrage tabagique]. *Sem Hôpital Paris* 1985;**61**:2155–60.
- Vibes 1977** *{published and unpublished data}*
 Vibes J. Clinical trial of the role of acupuncture in the fight against tobacco addiction [Essai thérapeutique sur le rôle de l'acupuncture dans la lutte contre le tabagisme]. *Acupuncture* 1977;**51**:13–20.
- Waite 1998** *{published data only}*
 Waite NR, Clough JB. A single-blind, placebo-controlled trial of a simple acupuncture treatment in the cessation of smoking. *British Journal of General Practice* 1998;**48**:1487–90.
- White 1998** *{published data only}*
 White AR, Resch KL, Ernst E. Randomized trial of acupuncture for nicotine withdrawal symptoms. *Archives of Internal Medicine* 1998;**158**:2251–5.
- White 2007** *{published data only}*
 White AR, Moody RC, Campbell JL. Acupressure for smoking cessation—a pilot study. *BMC Complementary & Alternative Medicine* 2007;**7**:8.
- Wu 2007** *{published data only}*
 Wu TP, Chen FP, Liu JY, Lin MH, Hwang SJ. A randomized controlled clinical trial of auricular acupuncture in smoking cessation. *Journal of the Chinese Medical Association: JCMA* 2007;**70**(8):331–8.
- Yeh 2009** *{published data only}*
 Yeh ML, Chang CY, Chu NF, Chen HH. A six-week acupoint stimulation intervention for quitting smoking. *American Journal of Chinese Medicine* 2009;**37**(5):829–36.

References to studies excluded from this review

Boureau, 1978 *{published data only}*

Boureau F, Willer JC. Failure of naloxone to modify the anti-tobacco effect of acupuncture [Desintoxification tabagique par l'acupuncture: essai negative de blocage par la naloxone]. *Nouvelle Presse Medicale* 1978;7:1401.

Boutros 1998 *{published data only}*

Boutros NN, Krupitsky EM. Cranial electrostimulation therapy. *Biological Psychiatry* 1998;43(6):468.

Chen 2006 *{published data only}*

Chen HH, Yeh ML, Chao YH. Comparing effects of auricular acupressure with and without an Internet-assisted program on smoking cessation and self-efficacy of adolescents. *Journal of Alternative & Complementary Medicine* 2006;12:147–52.

Fang 1983 *{published data only}*

Fang YA. [Clinical study on auricular acupuncture for treatment of smoking addiction] [Chinese]. *Shanghai Journal of Acupuncture and Moxibustion* 1983;2:30–1.

Hyun 2010 *{published data only}*

Hyun MK, Lee MS, Kang K, Choi SM. Body Acupuncture for Nicotine Withdrawal Symptoms: A Randomized Placebo-controlled Trial. *Evidence Based Complementary Alternative Medicine* 2010;7:233–8.

Kang 2005 *{published data only}*

Kang H-C, Shin K-K, Kim K-K, Youn B-B. The effects of the acupuncture treatment for smoking cessation in high school student smokers. *Yonsie Medical Journal* 2005;46:206–12.

MacHovec 1978 *{published data only}*

MacHovec FJ, Man SC. Acupuncture and hypnosis compared: fifty-eight cases. *American Journal of Clinical Hypnosis* 1978;21(1):45–7.

Man 1975 *{published data only}*

Man SC. A preliminary clinical study of smoking treated by stitch-auriculo-acupuncture. Proceedings of the Third World Symposium on Acupuncture and Chinese Medicine. New York, March 1975.

Sun 2000 *{published data only}*

Sun C. [Roles of psychological nursing played in the course of auricle point applying to help individuals giving up smoking] [Chinese]. *Shanxi Nursing Journal* 2000;14(2):69–70.

Tan 1987 *{published data only}*

Tan CH. The use of laser on acupuncture points for smoking cessation. *American Journal of Acupuncture* 1987;15(2):137–41.

Wang 2010 *{published data only}*

Wang YZ, Chen HH, Yeh ML, Lin SD. Auricular acupressure combined with multimedia instruction or alone for quitting smoking in young adults: A quasi-experimental study. *International Journal of Nursing Studies* 2010;47:1089–95.

Zhang 1989 *{published data only}*

Zhang J, Tan S, Yu J. [120 cases of quitting smoking by pressing seeds on body points and auricular points]. *Modern Traditional Chinese Medicine* 1989;4:28–9.

Zhou 2010 *{published data only}*

Zhou JH, Wang RF. Observation of therapeutic effect of electronic acupuncture combined with ear acupressure with magnetic balls. *Journal of Nanjing TCM University* 2010;26(1):79–80.

Additional references**Ashenden 1997**

Ashenden R, Silagy CA, Lodge M, Fowler G. A meta-analysis of the effectiveness of acupuncture in smoking cessation. *Drug and Alcohol Review* 1997;16:33–40.

Brewington 1994

Brewington V, Smith M, Lipton D. Acupuncture as a detoxification treatment: an analysis of controlled research. *Journal of Substance Abuse and Treatment* 1994;11(4):289–307.

Castera 2002

Castera P, Nguyen J, Gerlier J-L, Robert S. Is acupuncture beneficial in tobacco cessation, and is its effect specific? A meta-analysis. [L'acupuncture est-elle bénéfique dans la sevrage tabagique, son action est-elle spécifique? Une méta-analyse]. *Acupuncture & Moxibustion* 2002;1(3-4):76–85.

Chae 2004

Chae Y, Yang CH, Kwon YK, Kim MR, Pyun KH, Hahm DH. Acupuncture attenuates repeated nicotine-induced behavioral sensitization and c-Fos expression in the nucleus accumbens and striatum of the rat. *Neuroscience Letters* 2004;358(2):87–90.

Cheng 1980

Cheng RS, Pomeranz B, Yu G. Electroacupuncture treatment of morphine-dependent mice reduces signs of withdrawal, without showing cross-tolerance. *European Journal of Pharmacology* 1980;68:477–81.

Choy 1978

Choy YM, Tso WW, Fung KB, Leung KC, Tsang YF, Lee CY, et al. Suppression of narcotic withdrawals and plasma ACTH by auricular electroacupuncture. *Biochemical and Biophysical Research Communications* 1978;82:305–9.

Choy 1983

Choy DS, Lutzker L, Meltzer L. Effective treatment for smoking cessation. *American Journal of Medicine* 1983;75:1033–6.

Clavel 1984

Clavel F, Benhamou S. Tobacco withdrawal. Comparison of the efficacy of various methods. Intermediate results of a comparative study [Desintoxication tabagique. Comparaison de l'efficacité de différentes méthodes. Résultats intermédiaires d'une étude comparative]. *Presse Medicale* 1984;13(16):975–7.

Clavel 1990

Clavel F, Paoletti C. [Une étude de différents programmes de désintoxication tabagique portant sur près de 1000 volontaires recrutés dans la population générale : résultats à 1 mois]. *Revue d'Epidémiologie et de Santé Publique* 1990;38:133–8.

Clavel 1997

Clavel-Chapelon F, Paoletti C, Benhamou S. Smoking cessation rates 4 years after treatment by nicotine gum and acupuncture. *Preventive Medicine* 1997;26:25–8.

Clement-Jones 1979

Clement-Jones V, McLoughlin L, Lowry PJ, Besser GM, Rees LH, Wen HL. Acupuncture in heroin addicts: changes in met-enkephalin and beta-endorphin in blood and cerebrospinal fluid. *Lancet* 1979;2:380–3.

- Fuller 1982**
Fuller JA. Smoking withdrawal and acupuncture. *Medical Journal of Australia* 1982;**1**:28–9.
- Han 1993**
Han JS, Zhang RL. Suppression of morphine abstinence syndrome by body electroacupuncture of different frequencies in rats. *Drug and Alcohol Dependence* 1993;**31**:169–75.
- He 2001**
He D, Medbo JI, Hostmark AT. Effect of acupuncture on smoking cessation or reduction: an 8-month and 5-year follow-up study. *Preventive Medicine* 2001;**33**(5):364–72.
- Higgins 2003**
Higgins JPT, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analysis. *BMJ* 2003;**327**:557–60.
- Hui 2005**
Hui KK, Liu J, Marina O, Napadow V, Haselgrove C, Kwong KK, et al. The integrated response of the human cerebro-cerebellar and limbic systems to acupuncture stimulation at ST 36 as evidenced by fMRI. *NeuroImage* 2005;**27**(3):479–96.
- Jiang 1994**
Jiang A, Cui M. Analysis of therapeutic effects of acupuncture on abstinence from smoking. *Journal of Traditional Chinese Medicine* 1994;**14**(1):56–63.
- Jobst 1995**
Jobst KA. A critical analysis of acupuncture in pulmonary disease: efficacy and safety of the acupuncture needle. *Journal of Alternative and Complementary Medicine* 1995;**1**(1):57–85.
- Klawansky 1995**
Klawansky S, Yeung A, Berkey C, Shah N, Phan H, Chalmers TC. Meta-analysis of randomized controlled trials of cranial electrostimulation. *Journal of Nervous and Mental Disease* 1995;**183**:478–85.
- Law 1995**
Law M, Tang JL. An analysis of the effectiveness of interventions intended to help people stop smoking. *Archives of Internal Medicine* 1995;**155**:1933–41.
- Lewith 1995**
Lewith GT. The treatment of tobacco addiction. *Complementary Therapies in Medicine* 1995;**3**:142–5.
- Liang 2010**
Liang J, Ping XJ, Li YJ, Ma YY, Wu LZ, Han JS, Cui CL. Morphine-induced conditioned place preference in rats is inhibited by electroacupuncture at 2 Hz: role of enkephalin in the nucleus accumbens. *Neuropharmacology* 2010;**58**(1):233–40.
- Lund 2009**
Lund I, Naslund J, Lundeberg T. Minimal acupuncture is not a valid placebo control in randomised controlled trials of acupuncture: a physiologist's perspective. *Chinese Medicine* 2009;**4**:1.
- Lundeberg 2008**
Lundeberg T, Naslund J, Lund I, Thomas M. The Emperors sham - wrong assumption that sham needling is sham. *Acupuncture in Medicine* 2008;**26**(4):239–42.
- Ng 1975**
Ng LKY, Douthitt TC, Thoa NB, Albert CA. Modification of morphine-withdrawal syndrome in rats following transauricular stimulation: an experimental paradigm for auricular acupuncture. *Biological Psychiatry* 1975;**10**:575–80.
- Patterson 1993**
Patterson MA, Patterson L, Flood NV, Winston JR, Paterson SI. Electrostimulation in drug and alcohol detoxification: significance of stimulation criteria in clinical success. *Addiction Research* 1993;**1**:130–44.
- Sakurai 2000**
Sakurai Y, Yamaguchi M, Abiko Y. Inhibitory effect of low-level laser irradiation on LPS-stimulated prostaglandin E2 production and cyclooxygenase-2 in human gingival fibroblasts. *Eur J Oral Sci* 2000;**108**(1):29–34.
- Schwartz 1988**
Schwartz JL. Evaluation of acupuncture as a treatment for smoking. *American Journal of Acupuncture* 1988;**16**:135–42.
- Smith 1988**
Smith, MO. An acupuncture programme for the treatment of drug-addicted persons. *Bulletin on Narcotics* 1988;**40**(1):35–41.
- Ter Riet 1990**
Ter Riet G, Kleijnen J, Knipschild P. A meta-analysis of studies into the effect of acupuncture on addiction. *British Journal of General Practice* 1990;**40**:379–82.
- Vincent 1987**
Vincent CA, Richardson PH. Acupuncture for some common disorders: a review of evaluative research. *Journal of the Royal College of General Practitioners* 1987;**37**:77–81.
- Wen 1973**
Wen HL, Cheung SYC. Treatment of drug addiction by acupuncture and electrical stimulation. *Asian Medical Journal* 1973;**9**:138–41.
- White 2001**
White AR, Filshie J, Cummings TM. Clinical trials of acupuncture: consensus recommendations for optimal treatment, sham controls and blinding. *Complementary Therapies in Medicine* 2001;**9**(4):237–45.
- White 2009**
White AR, Editorial Board of Acupuncture in Medicine. Western medical acupuncture: a definition. *Acupuncture in Medicine* 2009;**27**(1):33–5.
- Yoon 2004**
Yoon SS, Kwon YK, Kim MR, Shim I, Kim KJ, Lee MH, Lee YS, Golden GT, Yang CH. Acupuncture-mediated inhibition of ethanol-induced dopamine release in the rat nucleus accumbens through the GABA(B) receptor. *Neuroscience Letters* 2004;**369**(3):234–8.
- Yoon 2010**
Yoon SS, Kim H, Choi KH, Lee BH, Lee YK, Lim SC, et al. Acupuncture suppresses morphine self-administration through the GABA receptors. *Brain Res Bull* 2010;**81**(6):625–30.
- Yoshimoto 2006**
Yoshimoto K, Fukuda F, Hori M, Kato B, Kato H, Hattori H, et al. Acupuncture stimulates the release of serotonin, but not

dopamine, in the rat nucleus accumbens. *Tohoku J Exp Med* 2006; **208**(4):321–6.

Zhang 1992

Zhang X. Acupuncture and moxibustion in smoking abstinence: a five year review with analysis of reports on the treatment of 15,866 cases. *International Journal of Clinical Acupuncture* 1992;**3**(2): 149–54.

References to other published versions of this review

White 1997

White AR, Rampes H, Ernst E. Acupuncture for smoking cessation. *Cochrane Database of Systematic Reviews* 1997, Issue 1.

White 2002

White AR, Rampes H, Ernst E. Acupuncture for smoking cessation. *Cochrane Database of Systematic Reviews* 2002, Issue 2.

* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Antoniou 2005

Methods	Country: Greece Recruitment. no details
Participants	Smokers (no other details)
Interventions	Single application of an electrical probe to the ear, (duration not stated) giving a) electrical stimulus with current intensity between 12-20 mAmp, or b) no current
Outcomes	Smoking cessation at 12 months, no details on how data were collected or verified
Notes	Abstract only. 390 smokers randomised, but group sizes at baseline not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	randomized in a 2:1 manner
Allocation concealment (selection bias)	Unclear risk	no details
Blinding (performance bias and detection bias) All outcomes	Unclear risk	described as 'double-blind' in the title, but stimulation was at a level that could be detected in the intervention group; blinding was not checked
Incomplete outcome data (attrition bias) All outcomes	High risk	390 smokers enrolled, 339 evaluated. No group size at baseline so dropouts cannot be accounted for by allocation group
Other bias	Unclear risk	no baseline details

Bier 2002

Methods	Country: United States Recruitment: media advertisements
Participants	141 smokers aged 18 or over, at least one previous attempt to stop, no major medical condition, not taking listed drugs e.g. phenothiazines, ephedrine
Interventions	a) true acupuncture b) true acupuncture and intensive education programme c) sham acupuncture plus intensive education programme True acupuncture consisted of 5 auricular points and LI4. Sham acupuncture consisted

Bier 2002 (Continued)

	of sham points 5mm away from real points. In both groups, needles were inserted for 30 minutes, and not stimulated. Acupuncture and sham were given in 20 sessions in 4 weeks. Educational programme was 7 x 1.5 hour sessions over 5 weeks	
Outcomes	Reported smoking cessation at 1, 3, 6, 12, 15 and 18 months. Outcome not validated. Percentage decrease in cigarette consumption also reported. Depression and anxiety scores analysed, not reported in detail.	
Notes	Data inconsistent and cannot be interpreted	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number table
Allocation concealment (selection bias)	Unclear risk	'Randomization ... conducted by a research associate blind to treatment assignment'
Blinding (performance bias and detection bias) All outcomes	Low risk	Groups b) and c) blinded: 'participants remained unaware of their [acupuncture] treatment group assignment'
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Numbers lost substantially different in different groups
Other bias	Low risk	No baseline differences for important variables

Cai 2000

Methods	Country: Singapore Recruitment: not stated
Participants	330 smokers, aged 12 to 18 smoking 3 yrs and minimum 5 cigs/day
Interventions	a) laser (wavelength 633 nm, 2.5-3mW for total 4 minutes) or b) deactivated laser to points in left ear, 12 times in 4 weeks. Patients wore blindfolds during treatment.
Outcomes	Smoking cessation immediately after and 3 months later reported. Validation: expired air CO concentration taken after 6th and 11th treatments (not at the first measurement point, which was after 12th treatment) and at 3 month follow up
Notes	Therapist not blinded: blinded assessor

Cai 2000 (Continued)

Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Block randomization, no details given
Allocation concealment (selection bias)	Unclear risk	No information given
Blinding (performance bias and detection bias) All outcomes	Low risk	Participants blindfolded; independent observer not involved in the treatment
Incomplete outcome data (attrition bias) All outcomes	Low risk	Dropout rates 19%, similar in both groups
Other bias	Low risk	No meaningful differences in baseline variables

Circo 1985

Methods	Country: Italy Recruitment: from patients with cardiovascular disorders, method of recruitment unclear
Participants	90 adults (80 male), no inclusion or exclusion criteria reported
Interventions	All participants received information and personalized advice, in addition to: a) illustration material b) medical treatment combining quinine ascorbate, vitamins and herbal extract (hawthorn), for 30 days c) auricular acupuncture to 9 ear points ('Nogier' anti-smoking programme) given for 15 minutes, 6 hours after stopping smoking and repeated after 4 and a further 7 days; combined with 3 indwelling auricular needles for 15 days. Other ear points (Shenmen, Sympathetic, Lung) could be added bilaterally
Outcomes	Reported cessation, time-point unspecified (we assume end-of-treatment) Validation: none reported
Notes	[in Italian]. Combine groups a) and b) as Intervention of unknown effectiveness

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details reported: 'suddivisi in modo random'

Circo 1985 (Continued)

Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Open study
Incomplete outcome data (attrition bias) All outcomes	Low risk	Outcomes reported for all included smokers
Other bias	Unclear risk	No baseline variables reported

Clavel 1985

Methods	Country: France Recruitment: Community volunteers, per advertisement
Participants	651 adults smoking >5 cigs/day
Interventions	a) facial acupuncture using two points bilaterally, single session b) nicotine gum - 105 pieces of 2mg gum c) cigarette case with lock controlled by time-switch All groups also received 3 one-hour sessions of group therapy in first month
Outcomes	Sustained cessation at 1 and 13 months Validation: none at 1 month; at 13 months, expired air CO concentration was tested in half of those claiming success (method of selection not reported)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'Balanced randomization' no further details
Allocation concealment (selection bias)	Unclear risk	No details
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Participants not blinded. No report of blinding observer
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropout rates over 80%, higher in control group
Other bias	Low risk	No significant differences in baseline variables

Clavel 1992

Methods	Country: France Recruitment: Community volunteers responding to circulated leaflet 2x2 factorial design (Smokers in this study who were randomized to active nicotine gum are represented by the study labelled 'Clavel 1992 +NG')
Participants	515 adults aged over 18, smoking >10 cigs/day
Interventions	a) facial acupuncture to two points (GB8 and Bitong), with placebo nicotine gum b) sham acupuncture (wrong points 2cm from the above), with placebo nicotine gum Acupuncture given on days 0, 7 and 28
Outcomes	Sustained abstinence at 1 and 13 months. (Outcome at 4 years reported in Clavel 1997) 'Need for cigarette' estimated weekly for 1 month Validation: nil
Notes	This study was first reported in French as Clavel 1990

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details: 'Tirés au sort'
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Factorial, double-dummy design; described as double blind; no details of blinding of the observer
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	80% dropout at one month
Other bias	Unclear risk	No description of baseline differences

Clavel 1992 +NG

Methods	Country: France Recruitment: Community volunteers responding to circulated leaflet 2x2 factorial design (Smokers in this study who were randomized to placebo nicotine gum are represented by the study labelled 'Clavel 1992')
Participants	481 adults aged over 18, smoking >10 cigs/day

Clavel 1992 +NG (Continued)

Interventions	a) facial acupuncture to two points (GB8 and Bitong), with active nicotine gum (2mg dose, up to 30 pieces/day, during first 6 months) b) sham acupuncture (wrong points 2cm from the above), with active nicotine gum (administration as above) Acupuncture given on days 0, 7 and 28
Outcomes	Sustained abstinence at 1 and 13 months. (Outcome at 4 years reported in another publication) 'Need for cigarette' estimated weekly for 1 month Validation: nil
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details: 'Tirés au sort'
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Factorial, double-dummy design; described as double blind; no details of blinding of the observer
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	80% dropout at one month
Other bias	Unclear risk	No description of baseline differences

Cottraux 1983

Methods	Country: France Recruitment: Community volunteers responding to TV and radio adverts
Participants	558 French citizens, aged 18-50, smoking >10 cigs/day for 2 years
Interventions	a) facial acupuncture, 3 weekly sessions b) behaviour therapy, weekly for 3 weeks c) placebo capsules prescribed at 2 consultations, labelled 'Medel 50' with instructions to avoid alcohol and stating that an overdose would result in gastric side-effects d) waiting-list control (assessed at 12 months only)
Outcomes	Sustained abstinence at 2 weeks, and 3, 6, 9 and 12 months Validation: none
Notes	

Cottraux 1983 (Continued)

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomization stratified by presence of smoker at home, but no further details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Open study, though the observers were blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information on dropouts
Other bias	Low risk	Groups balanced at baseline for several variables

Docherty 2003

Methods	Country: Scotland Recruitment: via social marketing campaign & general practitioners (GPs)
Participants	355 smokers from a community with high levels of social deprivation, No other details in abstract
Interventions	All participants received counselling and access to a telephone helpline A: Laser therapy. Duration and number of sessions not specified B: Placebo laser
Outcomes	Cessation at 6 and 12 months, CO measured, cut off not specified
Notes	Abstract only. No further information available

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomized, no details given
Allocation concealment (selection bias)	Unclear risk	Method not described
Blinding (performance bias and detection bias) All outcomes	Low risk	'Subjects and laser therapist blind'

Docherty 2003 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No description of dropouts or explanation for different group sizes
Other bias	Unclear risk	No baseline information reported

Georgiou 1999

Methods	Country: England Recruitment: general public, nursing staff, government employees 2x2x2 factorial design to test the following factors: electrical stimulation; stimulation frequency (constant or modulated); location (mastoid process as active, back as the control)
Participants	265 adults smoking at least 10 cigs/day for 1 year
Interventions	Either electrical stimulation (0.150 msec biphasic pulse, 0.5 to 0.8 mA into 1 KΩ load) or sham (control, no output) stimulation; with either continuous 10Hz or modulated 7-14Hz current (both active); to disposable pre-gelled electrodes placed on either mastoid (active) or upper back (location control); total of 8 groups Active groups: a) modulated current to mastoid process b) continuous current to mastoid Control groups: c) modulated current to back d) continuous current to back. e) sham modulated current to mastoid f) sham modulated current to back g) sham continuous current to mastoid h) sham continuous current to back. After initial stimulation, home use as required for 7 days
Outcomes	Smoking cessation at end of treatment, validated by expired air CO; withdrawal symptoms by VAS; follow-up data were collected for up to 12 months, but data are not presented by group
Notes	18% dropouts, numbers in each group are unknown. Follow-up data given as aggregate only. No significant differences.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Table of random numbers
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Participant blinded. 'Treatment was administered by a single clinician blinded ... to ... treatment'
Incomplete outcome data (attrition bias) All outcomes	Low risk	Dropouts 18% 'Attrition rates did not differ significantly across treatment condi-

Georgiou 1999 (Continued)

		tions'
Other bias	Unclear risk	No description of baseline differences between treatment groups

Gilbey 1977

Methods	Country: Canada Recruitment: Community volunteers responding to newspaper adverts
Participants	92 subjects aged 30-39 who smoked >15 cigs/day for 3 years
Interventions	a) indwelling needle in active auricular point ('Lung') for 1 week b) indwelling needle in inactive auricular point ('Kidney') for 1 week
Outcomes	Sustained abstinence at 1 week, 1 month and 3 months Validation: none
Notes	Some authors regard 'Kidney' point (used as a control) as an effective treatment for dependency

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'randomly assigned', no details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Participants and person collecting the follow-up data were blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information on dropout rate
Other bias	High risk	39% of treatment group and 65% of control group reported that they had been advised by their doctor to stop smoking

Gillams 1984

Methods	Country: UK Recruitment: volunteers responding to poster in health centre
Participants	81 adults smoking >50 cigs/week for 5 years
Interventions	a) indwelling needle in active auricular point ('Lung') for 4 weeks b) indwelling needle in inactive auricular point (as far from 'Lung' as possible) for 4 weeks c) group therapy sessions, one hour/ week for 4 weeks
Outcomes	Sustained abstinence at 4 weeks, 3 months, and 6 months Validation: none
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer programme
Allocation concealment (selection bias)	Low risk	Sealed envelopes containing cards defining the treatment group
Blinding (performance bias and detection bias) All outcomes	Low risk	Participants in the two acupuncture groups blinded. Acupuncturist not blinded, and no blinded observer
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data collection was completed for all patients entered into the study
Other bias	Unclear risk	No report of baseline differences

Han 2006

Methods	Country: Heilongjiang province, China Recruitment: Hospital based acupuncture clinic
Participants	42 participants (25 male, 17 female); age: 19-72 (female), 23-70 (male). Average age: 40 years; history of smoking > 10 years; 20-40 cigarettes per day
Interventions	10 day course of treatment in both conditions A: body + auricular acupuncture. Body points: <i>tianmi</i> point (the sensitive point on the line of <i>lieque</i> point and <i>yangxi</i> point); auricular points: <i>mouth</i> , <i>lung</i> , <i>pizhixia</i> , <i>neifenmi</i> , <i>heart</i> , <i>thirst</i> points B: auricular acupuncture. Auricular points: <i>mouth</i> , <i>lung</i> , <i>pizhixia</i> , <i>neifenmi</i> , <i>heart</i> , <i>thirst</i> points.

Han 2006 (Continued)

Outcomes	Abstinence at end of treatment sustained until 1 month follow up	
Notes	Acupuncture vs acupuncture [in Chinese]	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomly allocated, no details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information
Incomplete outcome data (attrition bias) All outcomes	Low risk	No cases lost to follow-up
Other bias	Unclear risk	No information

He 1997

Methods	Country: Norway Recruitment: employees recruited by internal advertisement through occupational health service
Participants	46 adults smoking for at least 5 years, daily average of 10-30 cigarettes in the last year; no other form of treatment for smoking cessation: no current acupuncture Exclusions: diabetes, coronary heart disease, pregnancy, breast-feeding
Interventions	Both groups received a combination of body electroacupuncture, ear acupuncture and ear acupressure: a) using genuine points described for smoking cessation b) using sham points described for treating musculoskeletal conditions 6 treatments over 3 weeks Manual and electrical stimulation were the same in the 2 groups In addition, 6 plant seeds were placed on either a) 'correct' or b) 'incorrect' points in the ear, according to group, and retained in place with adhesive tape: subjects were instructed to press on each seed 100 times on 4 occasions each day
Outcomes	Abstinence at 1 week and 8 months after the last acupuncture treatment (sustained at each previous point). Outcomes at 5 years are also reported. Validation: cessation confirmed by serum cotinine and thiocyanate concentrations. (Serum concentrations of fibrinogen and lipid peroxide were also measured) Daily cigarette consumption, taste for tobacco and desire to smoke were assessed by questionnaire

He 1997 (Continued)

Notes	Standardized interaction 8 month data used in 6 month meta-analysis. 5 yr data used in 1 yr + comparison does not include participants lost to follow up due to change of address etc
-------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	'Drawing lots with replacement'
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Participant blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	Only 10% loss to follow up, equal in the two groups
Other bias	Low risk	No baseline differences

Kerr 2008

Methods	Country: UK Recruitment: media announcement
Participants	387 motivated smokers without previous use of laser randomised. Excluded for age <16 years, pregnancy, uncontrolled ischaemic heart disease, asthma, unstable diabetes mellitus and unstable epilepsy
Interventions	a) Low-level laser treatment (Omega, power output 50mW, wavelength 820 nm, pulse repetition 20 Hz, radiant exposure 24J/cm sq) for 1 minute to 4 auricular and 3 wrist points bilaterally, total duration 14 minutes: on days 1, 3, and 7, plus sham laser on day 14 b) same active laser used on days 1, 3, 7 and 14 c) sham laser inactivated by manufacturer and identical except for no laser output, on days 1, 3, 7 and 14
Outcomes	Self-reported smoking cessation at end of treatment and after 3 and 6 months
Notes	Author provided additional data on group size at baseline. Data from group a) could not be used in meta-analysis (mixed interventions)

Risk of bias

Bias	Authors' judgement	Support for judgement
------	--------------------	-----------------------

Kerr 2008 (Continued)

Random sequence generation (selection bias)	Low risk	Not clear, but mentions use of random number table, selecting and allocating them sequentially to each of the study groups
Allocation concealment (selection bias)	High risk	Allocation of next patient could be ascertained from table
Blinding (performance bias and detection bias) All outcomes	Low risk	Sham or inactive probe
Incomplete outcome data (attrition bias) All outcomes	High risk	23 lost before treatment, 24 did not complete treatment. Unequal dropouts, 38/47 were in group C. Effect is likely small bias in favour of intervention
Other bias	Unclear risk	No baseline characteristics reported

Labadie 1983

Methods	Country: France Recruitment: Community volunteers attending anti-smoking clinic
Participants	130 smokers (criteria not specified)
Interventions	a) medical treatment (advice plus benzodiazepine, lobeline and a 'detoxicant') b) acupuncture to auricular and body points; not stated whether repeated Both groups followed up weekly for 1 month, fortnightly for 3 months, monthly for a year
Outcomes	Abstinence and reduction of smoking at 8 weeks and 1 yr Validation: none
Notes	Control data deemed as 'intervention of unknown effectiveness'

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	By alternation
Allocation concealment (selection bias)	High risk	(alternation)
Blinding (performance bias and detection bias) All outcomes	High risk	Open study

Labadie 1983 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	Dropout during treatment a) 25% b) 17%. 8.5% loss to follow up
Other bias	Unclear risk	Only age reported at baseline

Lacroix 1977

Methods	Country: France Recruitment: not stated .
Participants	117 smokers; the only inclusion criterion was the wish to stop
Interventions	a) facial acupuncture, 3 points on each side for 30 minutes, weekly for 3 weeks b) sham acupuncture, 2 non-points on each side (duration not stated), weekly for 3 weeks All smokers also given standardised advice
Outcomes	Abstinence at 3 weeks Validation: none
Notes	[in French]

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Described as randomised but no details presented
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Not specifically described as blinded, but overtly designed for participant- (but not practitioner-) blinding
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropout rate 16% in treatment group, 34% in sham/placebo group
Other bias	Unclear risk	No baseline information

Lagrué 1980

Methods	Country: France Recruitment: not stated
Participants	154 smokers (criteria not specified)
Interventions	a) facial acupuncture, repeated after 1 week b) sham acupuncture, (using facial points called 'placebo' but not further described) repeated after 1 week All smokers also given standardised advice
Outcomes	Abstinence and 80% reduction in consumption at 1 week Validation: none
Notes	Practitioner specially trained to give both treatments without knowing which was active (i.e. a truly double-blind study) [in French]

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Allocated into groups of 5-7 receiving the same treatment
Allocation concealment (selection bias)	High risk	Groups were pre-arranged
Blinding (performance bias and detection bias) All outcomes	Low risk	Truly double-blind: both participant and practitioner blinded - practitioner was non-acupuncturist, specially trained for this study
Incomplete outcome data (attrition bias) All outcomes	High risk	over 20% dropout in both groups
Other bias	Unclear risk	No baseline information

Lamontagne 1980

Methods	Country: Canada Recruitment: Community volunteers responding to newspaper advert
Participants	75 subjects aged 20-50, smoking between 15 and 50 cigs/day, not taking drugs, and in good health
Interventions	a) acupuncture to auricular points ('Zero' and 'Lung') b) acupuncture to body points used for 'relaxation' c) self-monitor and report back All subjects given 2 appointments 1 week apart. All smokers also given written advice on smoking cessation

Lamontagne 1980 (Continued)

Outcomes	Abstinence at 2 weeks, 3 months, and 6 months; mean smoking rates for 14 day periods during study Validation: none	
Notes	Poor choice of acupuncture control procedure, since anti-smoking effect of 'relaxation' treatment cannot be ruled out	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'randomly' with no further details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Acupuncture control clearly designed to ensure blinding of participants, though not described as 'blind'
Incomplete outcome data (attrition bias) All outcomes	Low risk	One smoker in each group dropped out
Other bias	Unclear risk	No baseline information reported

Leung 1991

Methods	Country: Hong Kong Recruitment: Community volunteers responding to newspaper and radio adverts	
Participants	95 subjects who had smoked for at least 1 year and were motivated to stop	
Interventions	a) 10 daily sessions of behaviour therapy lasting 1.5 hours b) Indwelling needles in auricular points ('Shenmen' and 'Lung') replaced every 7 days ; two introductory information sessions followed by eight attendances in total, for supervision of the needles c) waiting-list control	
Outcomes	Abstinence and percentage reduction in consumption immediately after treatment and at 1, 3, and 6 months.	
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement

Leung 1991 (Continued)

Random sequence generation (selection bias)	Unclear risk	'randomly assigned' no further details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	High risk	Open study, no description of observer blinding
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Attrition 18%, some difference between groups
Other bias	Low risk	No major differences at baseline

Li 2009

Methods	Country: Shanghai, China Recruitment: 140 smokers from the community. The clinical trial was carried out in the outpatient department of acupuncture-moxibustion in Tian Shan TCM hospital, Shanghai. 20 cases of healthy non-smokers were also recruited to provide data for normal levels of sulfocyanide in urine. Statistics: Ridit test
Participants	Inclusion criteria: smoking >1 year; > 10 cigs/day, desire to give up smoking in 3 months; age: 18-65 years old Intervention group: 70 (52 male, 18 female), age ranging from 18-58 (38.23±9.79) years old; smoking duration: 1-29 years (10.46±7.08); daily intake: 10-35 cigarettes (17.07±5.02). Control group: 70 (55 male, 15 female), age ranging from 20-59 (38.26±9.56) years old; smoking duration: 1-30 years (10.67±7.60); daily intake: 10-33 cigarettes (16.97±5.03) Baseline comparability: age, gender, smoking age, smoking amount.
Interventions	Administration: acupressure using the seed of cowherb . Group A: auricular points: mouth, lung, <i>shenmen</i> , <i>shenshangxian</i> , <i>stomach</i> , <i>neifenmi</i> . Group B (control): auricular points: thyroid, shoulder, sciatic nerve, clavicle, cervical vertebrae, eye. Seed applied to the main points in one ear and the accompanying points in the other ear: replaced every two days. Course of treatment: 20 days. Follow-up visit in 3 months.
Outcomes	Abstinence at 20 days (early) and 3 months (not used in meta-analysis). Confirmed by concentrations of sulfocyanide of urine tested in the morning
Notes	A sulfocyanide concentration of <(2.23±2.41)mg/L was observed in the non-smokers. Values above mean 2.23 mg/L were therefore taken to indicate smoking, i.e. that the intervention was not successful. No intention-to-treat (ITT) analysis was applied. 3 month follow-up too short for long term abstinence outcome [in Chinese]

Li 2009 (Continued)

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The cases are randomly allocated into the two groups, but sequence generation is not mentioned.
Allocation concealment (selection bias)	Unclear risk	No details
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No details
Incomplete outcome data (attrition bias) All outcomes	Low risk	Number of participants with loss to follow up reported; 1/70 in intervention group, 3/70 in control group
Other bias	Unclear risk	No information reported

Martin 1981a

Methods	Country: New Zealand Recruitment: Community volunteers
Participants	126 smokers (criteria not specified)
Interventions	a) indwelling needles to effective auricular points ('Lung' and 'hunger') for 3 weeks b) indwelling needles to ineffective auricular points ('elbow' and 'eye') Other groups with needling in the ankle or with cut-off studs were not conducted in parallel with the above and have been excluded from the review
Outcomes	Abstinence and reduction in cigarette consumption at 3 weeks, 3 months and 6 months Validation: nil
Notes	Some authors would consider 'elbow' and 'eye' points (used as controls) as possibly effective, since innervated by the vagus nerve

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Study run in three phases, randomisation method not described
Allocation concealment (selection bias)	Unclear risk	No information

Martin 1981a (Continued)

Blinding (performance bias and detection bias) All outcomes	Low risk	Described as single blind, and the interventions were appropriate
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropout rate 22%, 31% overall
Other bias	Low risk	Groups similar in sex, age and smoking habits

Martin 1981b

Methods	Country: New Zealand Recruitment: Community volunteers Randomization: in groups, method not stated
Participants	134 smokers (unspecified)
Interventions	a) indwelling needles to effective auricular points ('Lung' and 'hunger') for 3 weeks plus electroacupuncture for 20 minutes to LI4 in the hand and Tongue the ear at the second attendance b) indwelling needles to ineffective auricular points ('elbow' and 'eye') plus electroacupuncture for 20 minutes to LI4 in the hand and Tongue in the ear at the second attendance Other groups with needling in the ankle or with cut-off studs were not conducted in parallel with the above and have been excluded from the review
Outcomes	Abstinence and reduction in cigarette consumption at 3 weeks, 3 months and 6 months Validation: nil
Notes	Some authors would consider 'elbow' and 'eye' points (used as controls) as possibly effective, since innervated by the vagus nerve

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Study run in three phases, randomisation method not described
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Described as single blind, and the interventions were appropriate
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropout rate 22% in short term, 31% overall

Martin 1981b (Continued)

Other bias	Low risk	Groups similar in sex, age and smoking habits
------------	----------	-----------------------------------------------

Parker 1977a

Methods	Country: USA Recruitment: Volunteers from hospital employees
Participants	18 smokers (aged 19 to 60 years, other characteristics unspecified)
Interventions	a) indwelling needles placed in effective auricular points ('Shenmen' and 'Lung') b) indwelling needles placed in points considered inactive ('Shoulder' and 'Eye') Needles replaced in both groups twice weekly for 3 weeks
Outcomes	Abstinence and reduction in consumption at 6 weeks Validation: none
Notes	Some authors would not agree that 'shoulder' and 'eye' points are 'inactive'

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'randomly' no further details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Designed to be participant blind
Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropouts
Other bias	Unclear risk	Baseline data not reported

Parker 1977b

Methods	Country: USA Recruitment: Volunteers from hospital employees
Participants	23 smokers (aged 19 to 60 years, other characteristics unspecified)
Interventions	a) electrical stimulation to effective auricular points ('Shenmen' and 'Lung') b) electrical stimulation to points considered inactive ('Shoulder' and 'Eye') Both groups treated for 20 minutes twice weekly for 3 weeks

Parker 1977b (Continued)

Outcomes	Abstinence and reduction in consumption at 6 weeks Validation: none	
Notes	Some authors would not agree that 'shoulder' and 'eye' points are 'inactive'	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'randomly' no further details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	Designed to be participant blind
Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropouts
Other bias	Unclear risk	Baseline data not reported

Pickworth 1997

Methods	Country: USA Recruitment: 'from community' Randomization method: the instrument manufacturer 'prepared sealed envelopes containing a cartridge and an insert that was randomly assigned to each subject'	
Participants	121 adults aged over 21 yrs, smoking >20/day for at least 1 yrs, no psychoactive medications; without pregnancy, drug history, medical condition, implanted device, history of seizures or migraine	
Interventions	5 consecutive days of 60 min of a) electrostimulation, 10Hz 2 msec pulse, 30 µamp to mastoid, or b) sham electrostimulation	
Outcomes	Abstinence after 5 days and 1 month, verified by exhaled CO. Withdrawal symptoms.	
Notes	Stimulation parameters were criticised by Boutros 1998	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Pickworth 1997 (Continued)

Random sequence generation (selection bias)	Unclear risk	'randomly' not described
Allocation concealment (selection bias)	Low risk	Sealed envelopes prepared with cartridge and insert
Blinding (performance bias and detection bias) All outcomes	Low risk	Described as double-blind, and interventions were appropriate
Incomplete outcome data (attrition bias) All outcomes	Low risk	Dropout rates 16% and 17%
Other bias	Low risk	No baseline differences

Scheuer 2005

Methods	Country: Switzerland Recruitment: not stated
Participants	Smokers willing to quit (66 randomized, 64 followed up)
Interventions	Neuroelectric therapy (NET) in region of mastoid bone for 96 hours. Devices delivered a constant current of 10.0 mA and 35.0 V. Devices were fully automated and programmed to deliver either a) active treatment at 300 Hz b) placebo at 700 Hz (no justification or explanation given)
Outcomes	Smoking cessation at 4 days, 2 and 6 weeks, 3 and 6 months, validated by cotinine tests (no details)
Notes	Abstract only. No group sizes were given, only percentages of quitters in each group, and we were unable to contact the author. We therefore assumed two equal groups. [We imputed denominators at follow up from percentages that lead to whole numbers] The authors concluded that the 'placebo' stimulation might be active

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	randomly assigned
Allocation concealment (selection bias)	Unclear risk	no details given
Blinding (performance bias and detection bias) All outcomes	Low risk	'Placebo' used, no information on blinding of therapists

Scheuer 2005 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	no details given for dropouts
Other bias	Unclear risk	no baseline details given

Steiner 1982

Methods	Country: USA Recruitment: Community volunteers responding to newspaper and radio adverts
Participants	32 subjects over 21, smoking over 20 cigs/day for 2 consecutive years, not pregnant and not on chronic pain medication or mood-altering drugs Selected from 82 volunteers, matched according to age, sex, and cigarette consumption
Interventions	a) acupuncture to genuine body and ear points; needle sensation achieved. b) sham acupuncture to nearby areas without needling sensation Both interventions given twice weekly for 2 weeks
Outcomes	Abstinence and cigarette consumption at 4 weeks Validation: none
Notes	Subjects were not advised to stop smoking at any particular time, but to 'follow your motivation and appetite to the best of your ability'

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Matched pairs selected from volunteers, one of each pair randomly assigned, method not stated
Allocation concealment (selection bias)	Low risk	Inherent in the method of allocation
Blinding (performance bias and detection bias) All outcomes	Low risk	'Neither research volunteer nor data gatherers were aware of group assignments'
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	28% dropout rate
Other bias	Low risk	Matched for age, sex and smoking history

Tian 1996

Methods	Country: China Recruitment: not stated
Participants	120 smokers over 20 yrs old, regularly smoking >10 cigs/day, exhaled CO>10ppm, and 'likely to attend follow up for 1 year'
Interventions	a) acupressure, 'Ear Point Seed Pressing' method: seed fixed to 4 points in one ear, treatment changed to alternate ear twice/wk for course of 1 month, repeated for 2 or 3 months. Seeds to be pressed by smoker 6 times daily b) advice: no description given
Outcomes	Abstinence at 1 month and 1 yr, confirmed by CO measurement
Notes	Report lacks details (e.g., randomization, advice given, baseline characteristics) Error in results table: figures at 1 month do not reach correct total of 60

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'randomly' with no details
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	Open study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropouts not reported, estimated at 77%
Other bias	Low risk	Groups similar at baseline

Vandevenne 1985

Methods	Country: France Recruitment: volunteers attending anti-smoking clinic
Participants	200 self-referred smokers, no criteria stated
Interventions	a) acupuncture to 3 auricular and 2 body points b) sham acupuncture to nearby areas both interventions given on days 1, 4, 10 and 20
Outcomes	Abstinence (point-prevalence) at 6 weeks, 6 months and 1 year Not validated

Vandevenne 1985 (Continued)

Notes	[in French]	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number table
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	Low risk	Described as blinded, and interventions appropriate
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	42% dropout at 6 weeks
Other bias	Low risk	Groups similar in smoking history at baseline

Vibes 1977

Methods	Country: France Recruitment: not stated	
Participants	200 smokers of at least 20 cigs /day; already tried to reduce their consumption; no previous acupuncture; not using any other therapy for smoking cessation	
Interventions	6 treatment sessions 3 times a week for groups a) b) e). Indwelling needle for groups c) and d) a) 3 or 4 traditional acupuncture body points for cessation b) two nasal points c) auricular point Zero d) auricular point Lung e) control group: 2 points on hands/feet	
Outcomes	Smoking cessation at 14 days (not validated); reduction in cigarette consumption	
Notes	[in French]	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	randomised, no further details

Vibes 1977 (Continued)

Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	All groups received needling treatments, differences unlikely to lead to unblinding in the context
Incomplete outcome data (attrition bias) All outcomes	Low risk	Dropout rate reported as less than 5%
Other bias	Unclear risk	No baseline data presented

Waite 1998

Methods	Country: UK Recruitment: community volunteers recruited by advertisements in on-line news pages, posters in hospital and word of mouth.
Participants	78 adults over 18 years old who were smoking at least 10 cigs/day. Exclusions: cardiac pacemaker, previous acupuncture
Interventions	Both groups received one 20-minute session of acupuncture with electrical stimulation followed by placement of a seed on the needle site held in place with adhesive tape. Participants were instructed to keep the seed in place as long as they found it helpful and press it when they experienced the desire to smoke Points used were: a) active group, lung point in ear b) control group, medial aspect of the patella, not on recognised acupuncture point All smokers received structured counselling and written information before randomisation
Outcomes	Cessation at 2 weeks, and 2, 4 and 6 months (point prevalence) Validation at 6 months only: urinary cotinine
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomization, no further details
Allocation concealment (selection bias)	Unclear risk	No information
Blinding (performance bias and detection bias) All outcomes	Low risk	described as single blind, and interventions appropriate

Waite 1998 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	100% follow up at 6 months
Other bias	Low risk	Slightly heavier smokers in active group

White 1998

Methods	Country: UK Recruitment: community volunteers from media invitation
Participants	76 adults over 21 years smoking at least 15 cigs/day Exclusions: previous acupuncture, pregnancy, breast-feeding, cardiac pacemaker, known bleeding tendency
Interventions	a) acupuncture with electrical stimulation to lung point in both ears b) sham acupuncture consisting of either needle or carbon pad placed over the mastoid bone attached to sham (inactivated) stimulator Interventions were given on day 1, 3 and 7 of the smoking cessation All smokers also received counselling by a nurse
Outcomes	Sustained cessation at 2 weeks Validation: expired air CO concentration Withdrawal symptoms assessed by Visual Analogue Scale Reported cessation at 9 months (not validated)
Notes	Credibility of interventions tested by questionnaire Standardized, minimal interaction by acupuncturist All counselling by blinded nurse

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	computer-generated
Allocation concealment (selection bias)	Low risk	Sealed envelopes opened immediately before intervention
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded participant (though control group felt no electrical stimulation), blinded assessor
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	32% dropout or withdrawal rate

White 1998 (Continued)

Other bias	Low risk	Marginally heavier smokers in active treatment group
------------	----------	------------------------------------------------------

White 2007

Methods	Country: England Recruitment: smoking cessation clinic
Participants	19 smokers, aged ≥ 18 years, smoked ≥ 10 cigs/day, prescribed NRT; no general or auricular medical conditions or specified medications
Interventions	All participants received the usual NRT and group counselling and support. In addition, Pyonex type acupuncture beads (specially manufactured for the study) were used. a) two beads, in Lung and Shenmen points b) one bead in Lung point c) no bead. Beads worn for 4 weeks, replaced when necessary or every 14 days
Outcomes	Reported cessation at 4 weeks verified by expired air CO ≤ 9 ppm
Notes	Pilot study, mainly testing recruitment and feasibility. Data from two intervention groups combined

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	code generated by computerised blocked randomisation prepared by researcher unconnected with the study
Allocation concealment (selection bias)	Low risk	participant opened opaque, numbered envelope
Blinding (performance bias and detection bias) All outcomes	High risk	open study
Incomplete outcome data (attrition bias) All outcomes	High risk	5 randomised patients not included in the analysis, and no information on group allocation
Other bias	Low risk	no major baseline differences

Wu 2007

Methods	Country: Taipei, Taiwan Recruitment: advertisements through hospital; those attending smoking cessation clinic
Participants	131 smokers aged ≥ 18 years, smoking ≥ 10 cigs/day, and smoked ≥ 1 year; has no specified diseases, not taking specified medication, not abusing drugs
Interventions	Indwelling needles inserted into four auricular points and retained for one week, then replaced. Total treatment period 8 weeks. Points used: a) 'real' points Shenmen, Lung, Mouth, Sympathetic b) 'irrelevant' points Eye, Elbow, Shoulder, Knee All participants also received counselling from a nurse
Outcomes	Reported cessation at end of treatment and 6 months follow up; verbal report validated by exhaled air CO concentration in those who could attend clinic; telephone call to defaulters (numbers of defaulters not reported)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	block randomization method with random number table
Allocation concealment (selection bias)	Unclear risk	no details given
Blinding (performance bias and detection bias) All outcomes	Low risk	study not described as blinded, but clearly designed subject-blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	full details of dropouts and reasons: 5 in group a) and 8 in group b)
Other bias	Low risk	no baseline differences

Yeh 2009

Methods	Country: Taiwan Recruitment: community volunteers
Participants	79 healthy smokers, serum cotinine >100 ng/ml, daily consumption >1 CPD
Interventions	a) active acupoint stimulation; <i>shenmen</i> , lung, stomach, mouth, endocrine & <i>tim mee</i> b) sham stimulation, 5mm away from real acupoint locations (We were unable to clarify whether the intervention was applied uni- or bilaterally) All participants used the electron acupuncture with low frequency (9V, < 60 Hz) once a week for 6 weeks, for twenty minutes each time. A seed-embedding method was then

Yeh 2009 (Continued)

	used on these auricular points. All participants were instructed to apply pressure on the auricular points for one minute each time, and three to five times each day for six weeks. The auricular seeds were replaced with new ones each week.	
Outcomes	Cessation based on serum cotinine <100 ng/ml at 6 weeks, participant self-report not used	
Notes	Groups only differed in the site that the stimulation was given, i.e. a true test of point location	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	'Randomly assigned', no further details
Allocation concealment (selection bias)	Unclear risk	No details given
Blinding (performance bias and detection bias) All outcomes	Low risk	study not described as blinded, but clearly designed subject-blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	9 I and 11 C withdrew before end of treatment, excluded from reported outcomes, reincluded in denominators for MA
Other bias	Low risk	no major baseline differences

CPD: cigarettes per day
CO: carbon monoxide
yr: year

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Boureau, 1978	This study compared 2 groups who both received identical acupuncture following an injection: one group were injected with saline, the other with naloxone. Therefore, 2 hypotheses are tested simultaneously: does acupuncture help smoking cessation by releasing endogenous opioid peptides?
Boutros 1998	This letter in response to the study of Pickworth commented on the stimulus parameters used in the study, but included no original data
Chen 2006	All participants received acupressure; test of an internet programme; not randomised

(Continued)

Fang 1983	Outcome was reduction in amount smoked by half or more, not cessation.
Hyun 2010	Cessation outcomes not reported
Kang 2005	School children in two schools allocated according to which school they attended, without mention of randomisation. One case of smoking cessation recorded, so exclusion unlikely to bias review
MacHovec 1978	This study does not specify that the subjects were randomized
Man 1975	Subjects were allocated by place of residence, not randomly
Sun 2000	The two intervention groups received the same acupuncture, and differed only in the use of psychological nursing care
Tan 1987	Not described as randomized: complete abstinence not reported.
Wang 2010	All participants received acupressure; test of a multimedia programme. Not randomised
Zhang 1989	Compares two active acupuncture conditions: both use 'Lung' auricular point which is widely considered an active intervention.
Zhou 2010	The trial compared electronic acupuncture combined with ear acupressure with magnetic balls against electronic acupuncture alone, therefore, electronic acupuncture is considered as co-intervention, and any potential effect would be come from acupressure combined with magnetic balls on ear acupoints.

DATA AND ANALYSES

Comparison 1. Acupuncture vs waiting list/no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 Smoking cessation - late	3	393	Risk Ratio (M-H, Fixed, 95% CI)	1.79 [0.98, 3.28]

Comparison 2. Acupuncture vs sham acupuncture

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	14	2206	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [1.03, 1.34]
2 Smoking cessation - late	8	1662	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.82, 1.35]
3 Including possibly active control interventions - early	18	2528	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [1.04, 1.33]
4 Including possibly active control interventions - late	11	1892	Risk Ratio (M-H, Fixed, 95% CI)	1.10 [0.86, 1.40]

Comparison 3. Acupuncture vs other intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 NRT	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 Smoking cessation - early	2	914	Risk Ratio (M-H, Fixed, 95% CI)	0.76 [0.59, 0.98]
1.2 Smoking cessation - late	2	914	Risk Ratio (M-H, Fixed, 95% CI)	0.64 [0.42, 0.98]
2 Counselling and psychological approaches	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 Smoking cessation - early	3	396	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.72, 1.26]
2.2 Smoking cessation - late	3	396	Risk Ratio (M-H, Fixed, 95% CI)	1.34 [0.80, 2.24]
3 Interventions of unknown effectiveness	4		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3.1 Smoking cessation - early	4		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.2 Smoking cessation - late	3		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 4. Comparison between two types of acupuncture

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 5. Acupressure vs waiting list/no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 Smoking cessation - late	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 6. Acupressure vs sham acupressure

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 Smoking cessation - late	0	0	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 8. Laser therapy vs sham laser

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 Smoking cessation - late	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 10. Electrostimulation vs sham stimulation

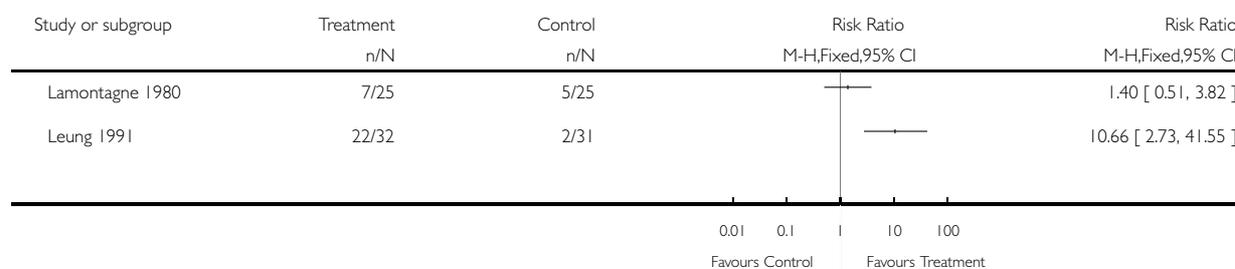
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Smoking cessation - early	4	462	Risk Ratio (M-H, Fixed, 95% CI)	1.17 [0.89, 1.54]
2 Smoking cessation - late	2	405	Risk Ratio (M-H, Fixed, 95% CI)	0.87 [0.61, 1.23]

Analysis 1.1. Comparison 1 Acupuncture vs waiting list/no intervention, Outcome 1 Smoking cessation - early.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 1 Acupuncture vs waiting list/no intervention

Outcome: 1 Smoking cessation - early

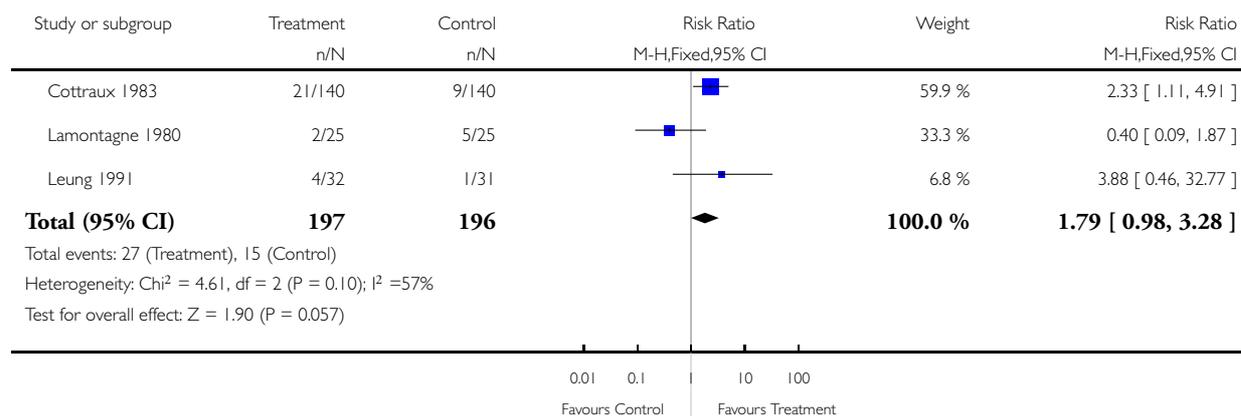


Analysis 1.2. Comparison 1 Acupuncture vs waiting list/no intervention, Outcome 2 Smoking cessation - late.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 1 Acupuncture vs waiting list/no intervention

Outcome: 2 Smoking cessation - late

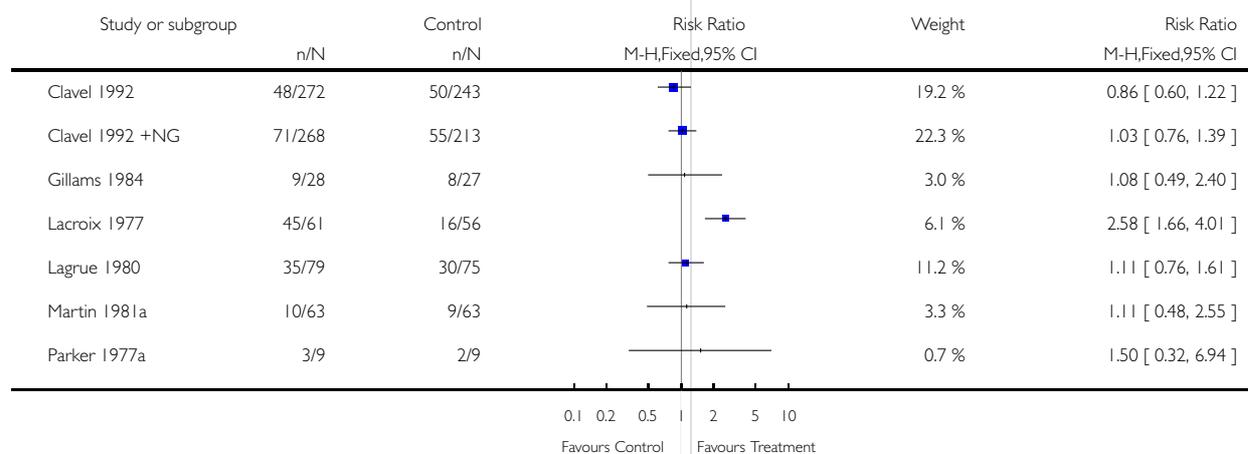


Analysis 2.1. Comparison 2 Acupuncture vs sham acupuncture, Outcome 1 Smoking cessation - early.

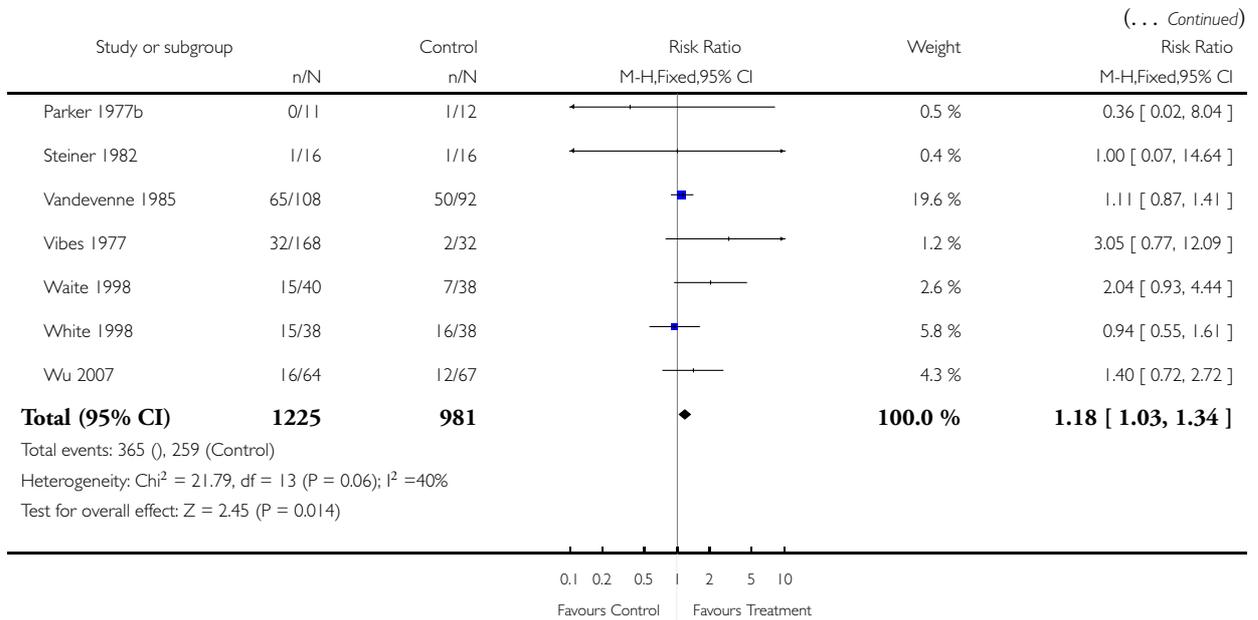
Review: Acupuncture and related interventions for smoking cessation

Comparison: 2 Acupuncture vs sham acupuncture

Outcome: 1 Smoking cessation - early



(Continued ...)

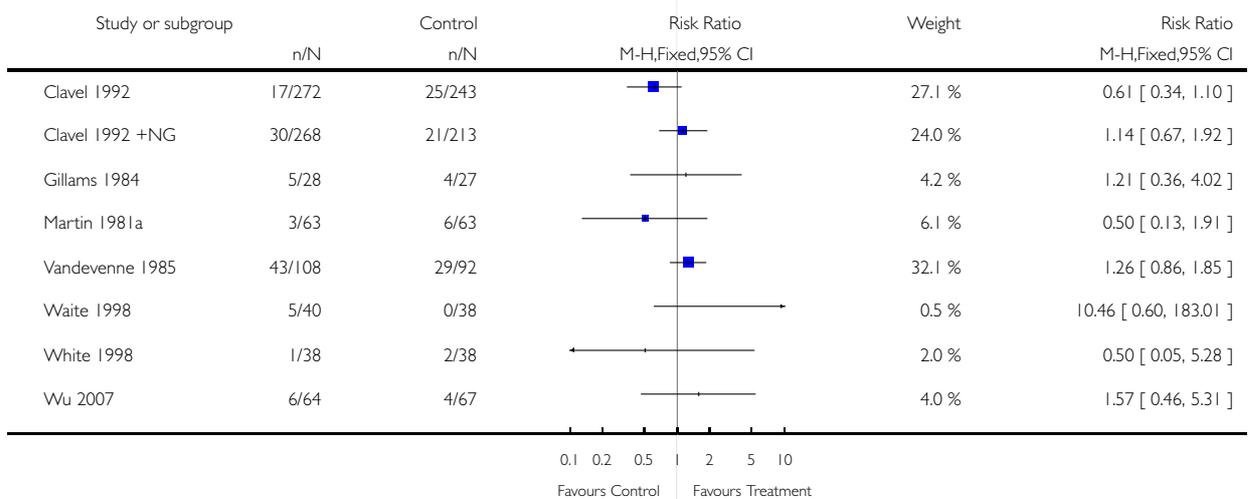


Analysis 2.2. Comparison 2 Acupuncture vs sham acupuncture, Outcome 2 Smoking cessation - late.

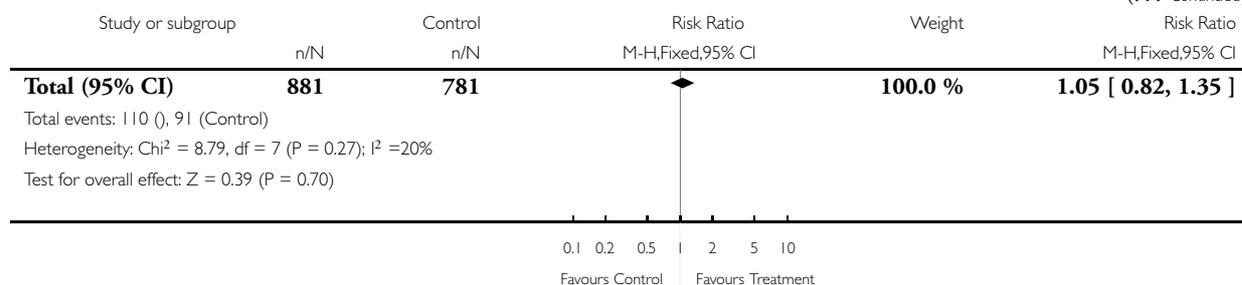
Review: Acupuncture and related interventions for smoking cessation

Comparison: 2 Acupuncture vs sham acupuncture

Outcome: 2 Smoking cessation - late



(... Continued)

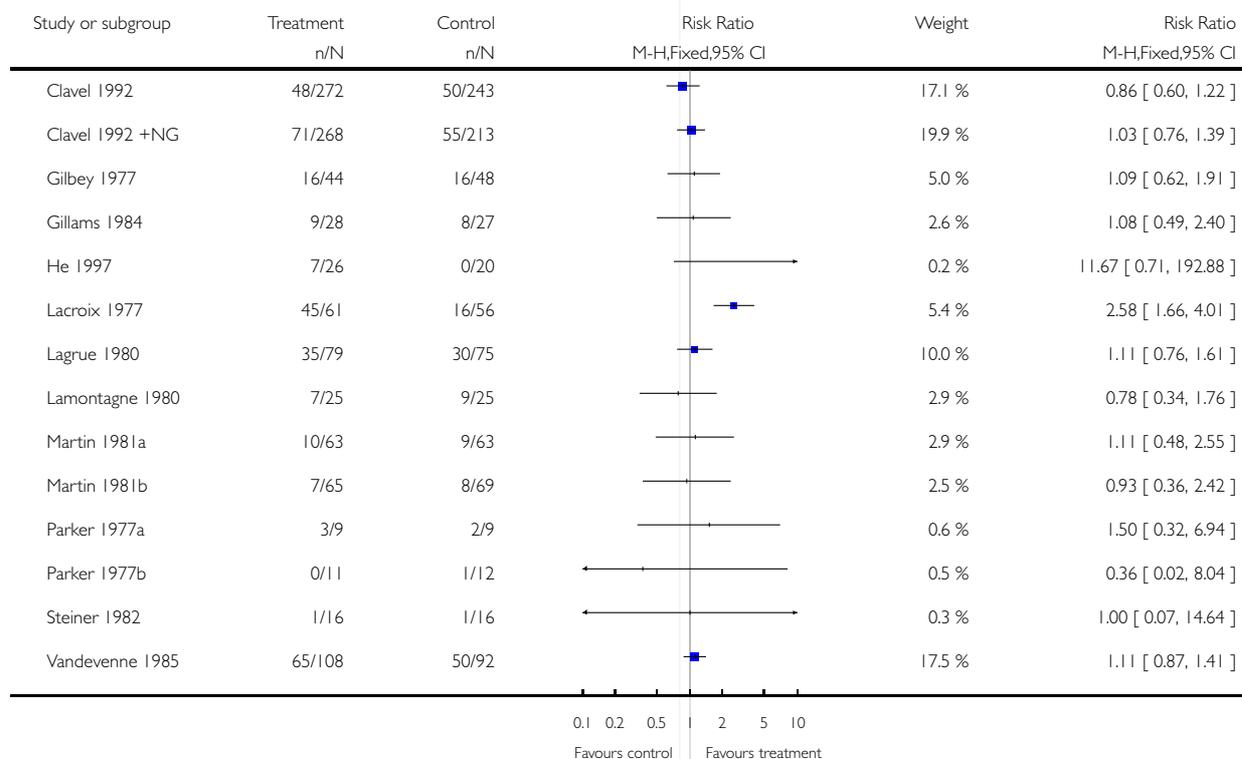


Analysis 2.3. Comparison 2 Acupuncture vs sham acupuncture, Outcome 3 Including possibly active control interventions - early.

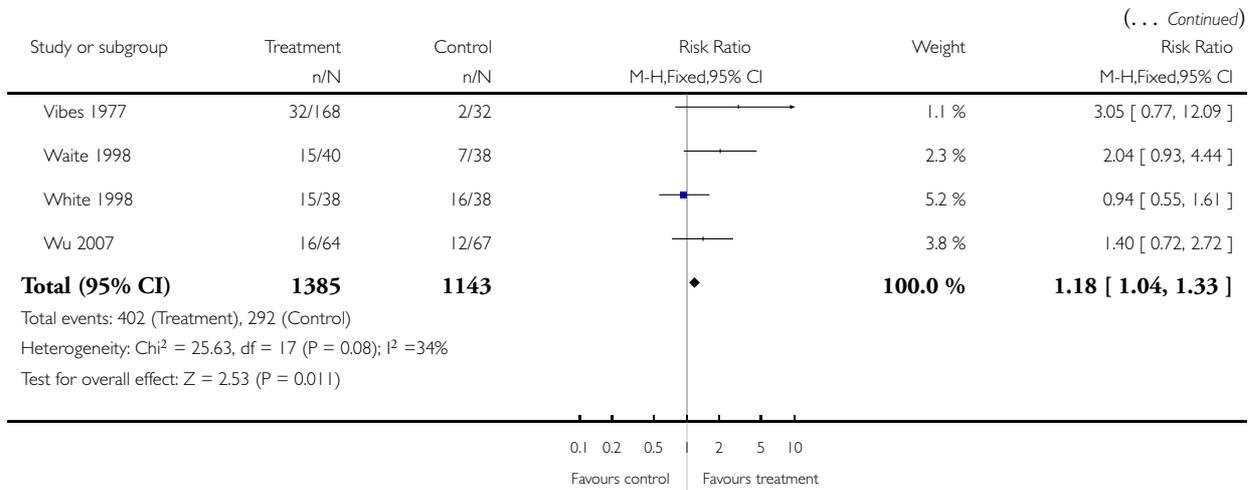
Review: Acupuncture and related interventions for smoking cessation

Comparison: 2 Acupuncture vs sham acupuncture

Outcome: 3 Including possibly active control interventions - early



(Continued ...)

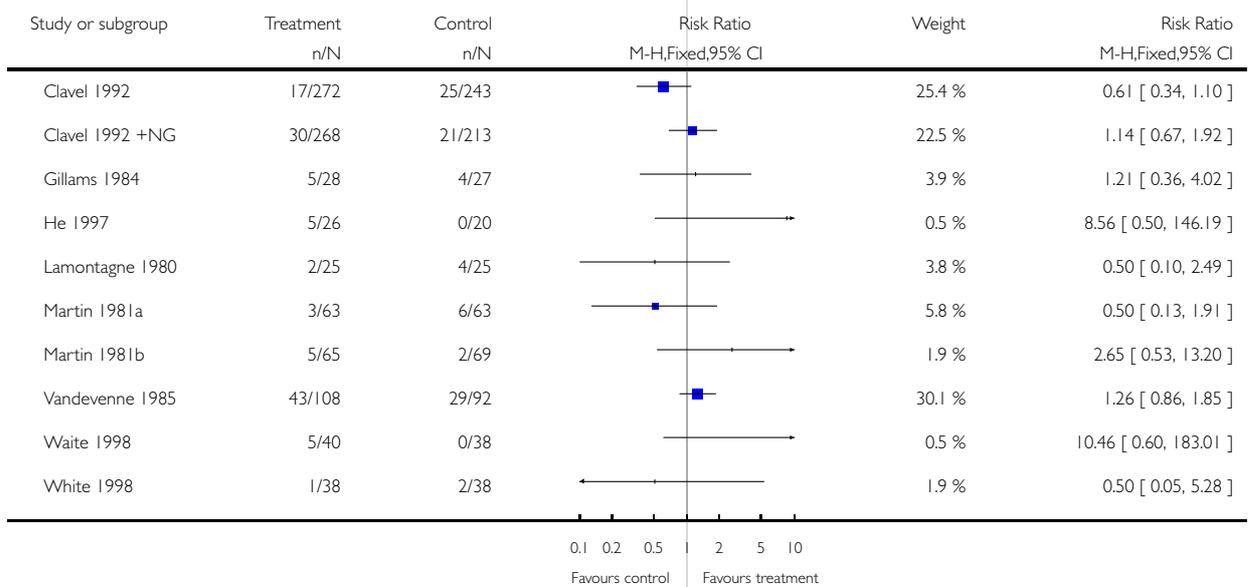


Analysis 2.4. Comparison 2 Acupuncture vs sham acupuncture, Outcome 4 Including possibly active control interventions - late.

Review: Acupuncture and related interventions for smoking cessation

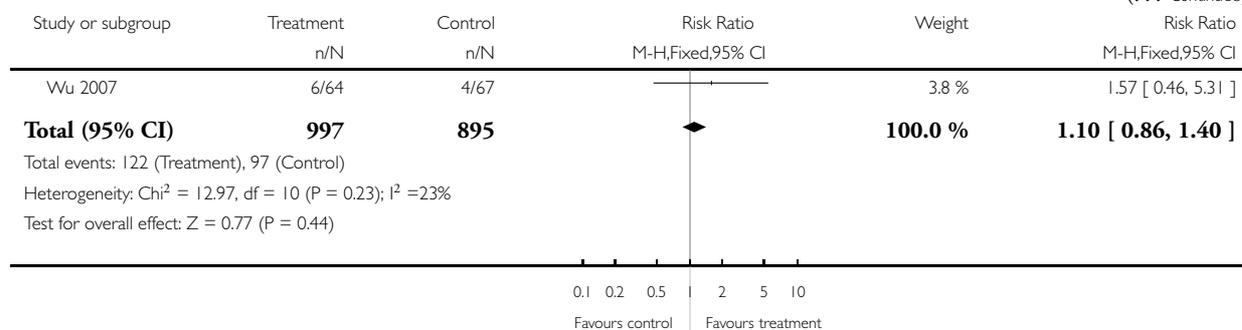
Comparison: 2 Acupuncture vs sham acupuncture

Outcome: 4 Including possibly active control interventions - late



(Continued . . .)

(... Continued)

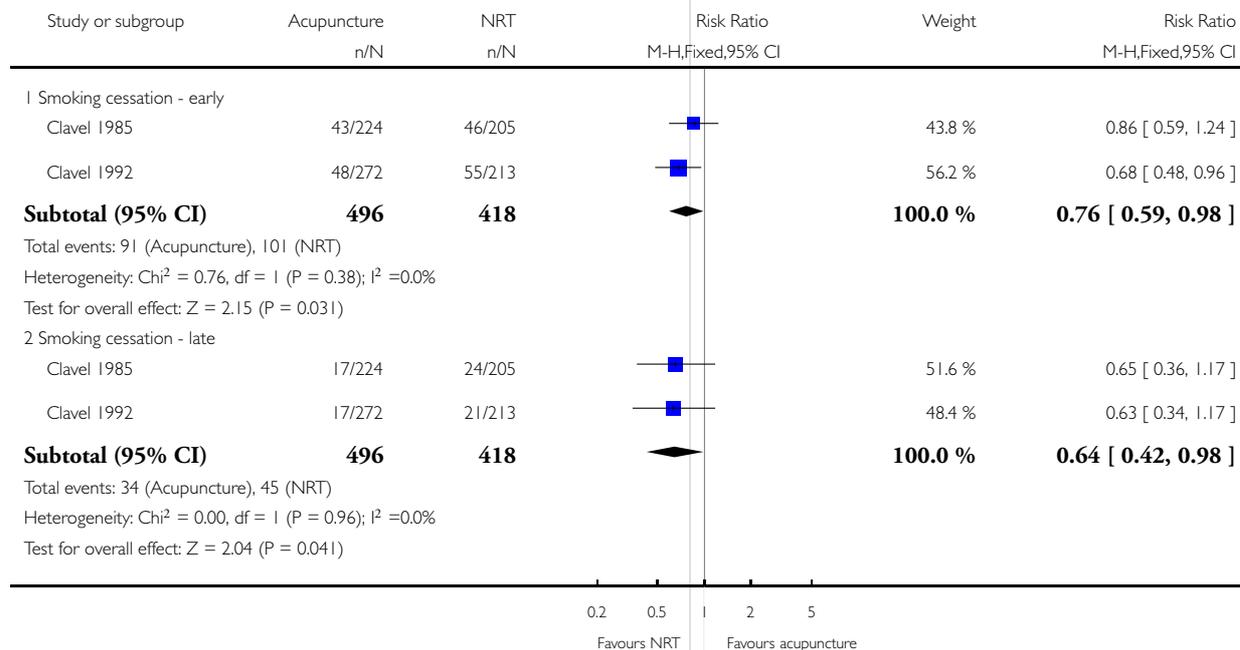


Analysis 3.1. Comparison 3 Acupuncture vs other intervention, Outcome 1 NRT.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 3 Acupuncture vs other intervention

Outcome: 1 NRT

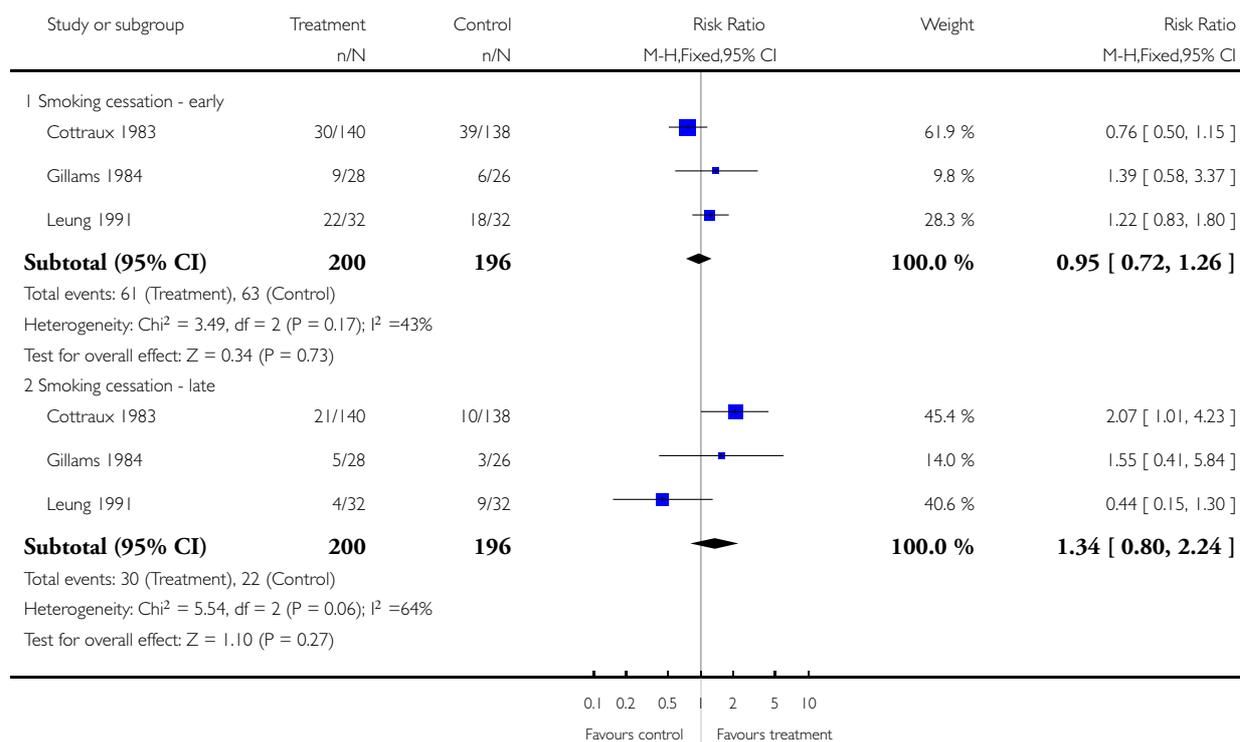


Analysis 3.2. Comparison 3 Acupuncture vs other intervention, Outcome 2 Counselling and psychological approaches.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 3 Acupuncture vs other intervention

Outcome: 2 Counselling and psychological approaches

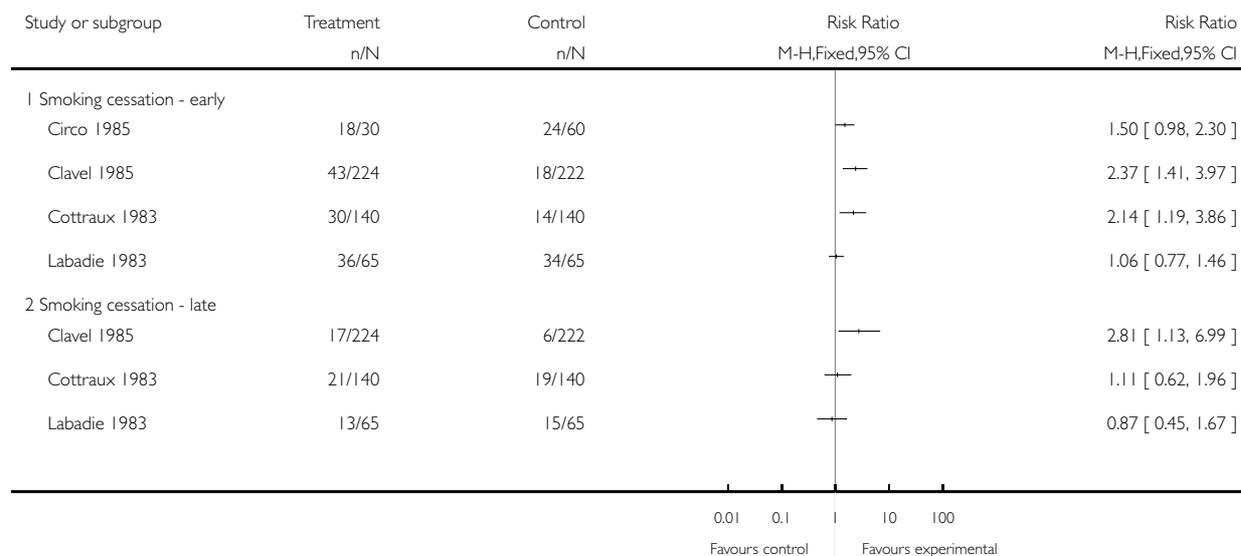


Analysis 3.3. Comparison 3 Acupuncture vs other intervention, Outcome 3 Interventions of unknown effectiveness.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 3 Acupuncture vs other intervention

Outcome: 3 Interventions of unknown effectiveness

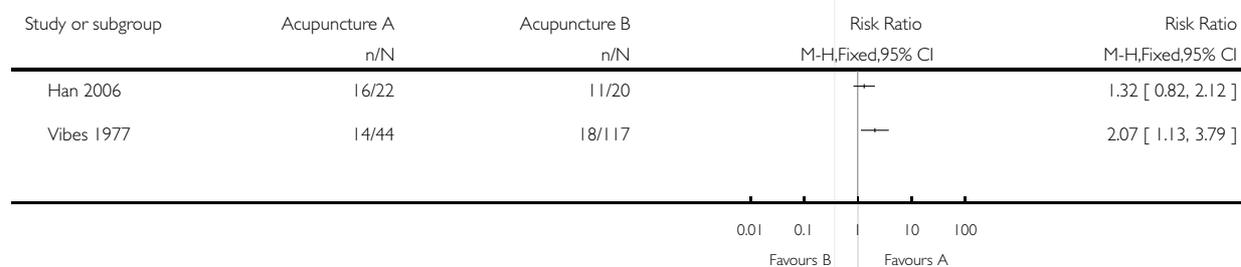


Analysis 4.1. Comparison 4 Comparison between two types of acupuncture, Outcome 1 Smoking cessation - early.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 4 Comparison between two types of acupuncture

Outcome: 1 Smoking cessation - early

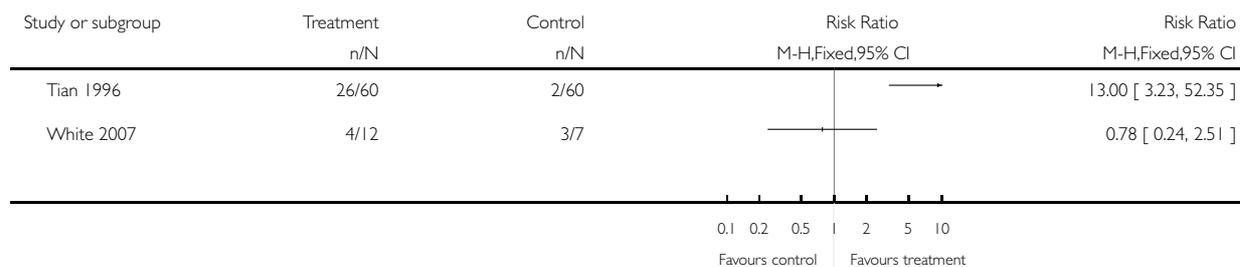


Analysis 5.1. Comparison 5 Acupressure vs waiting list/no intervention, Outcome 1 Smoking cessation - early.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 5 Acupressure vs waiting list/no intervention

Outcome: 1 Smoking cessation - early

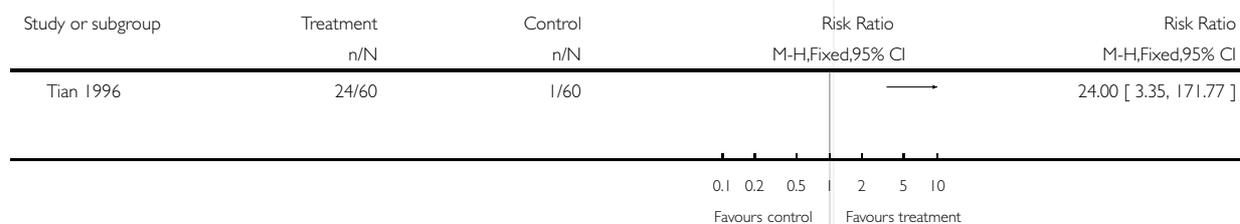


Analysis 5.2. Comparison 5 Acupressure vs waiting list/no intervention, Outcome 2 Smoking cessation - late.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 5 Acupressure vs waiting list/no intervention

Outcome: 2 Smoking cessation - late

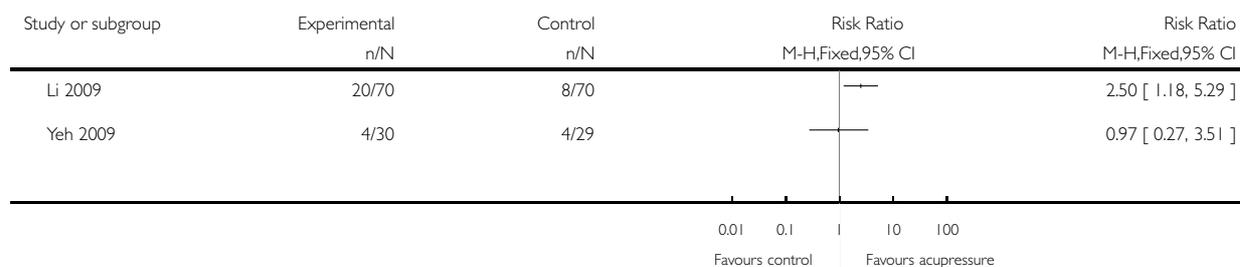


Analysis 6.1. Comparison 6 Acupressure vs sham acupressure, Outcome 1 Smoking cessation - early.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 6 Acupressure vs sham acupressure

Outcome: 1 Smoking cessation - early

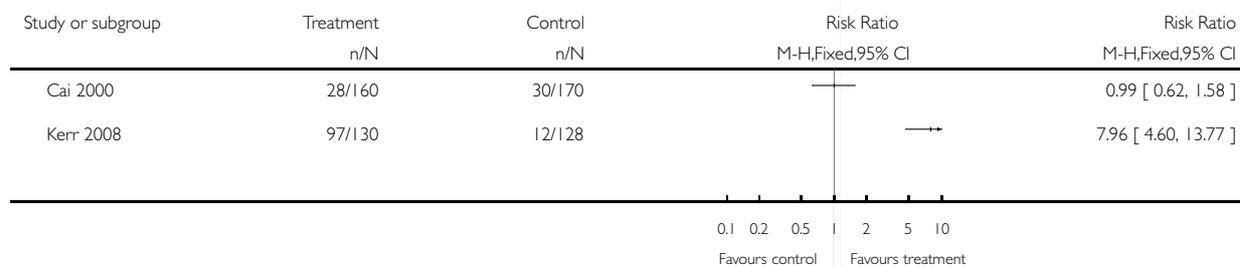


Analysis 8.1. Comparison 8 Laser therapy vs sham laser, Outcome 1 Smoking cessation - early.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 8 Laser therapy vs sham laser

Outcome: 1 Smoking cessation - early

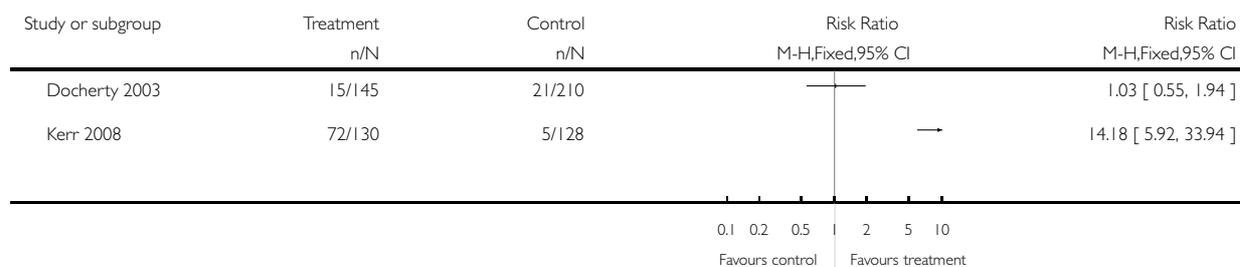


Analysis 8.2. Comparison 8 Laser therapy vs sham laser, Outcome 2 Smoking cessation - late.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 8 Laser therapy vs sham laser

Outcome: 2 Smoking cessation - late

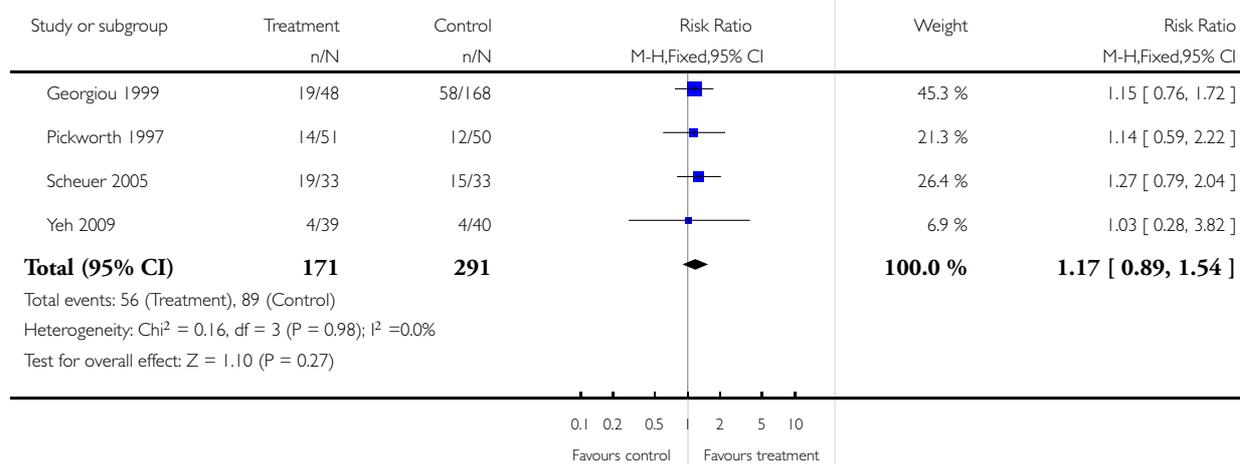


Analysis 10.1. Comparison 10 Electrostimulation vs sham stimulation, Outcome 1 Smoking cessation - early.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 10 Electrostimulation vs sham stimulation

Outcome: 1 Smoking cessation - early

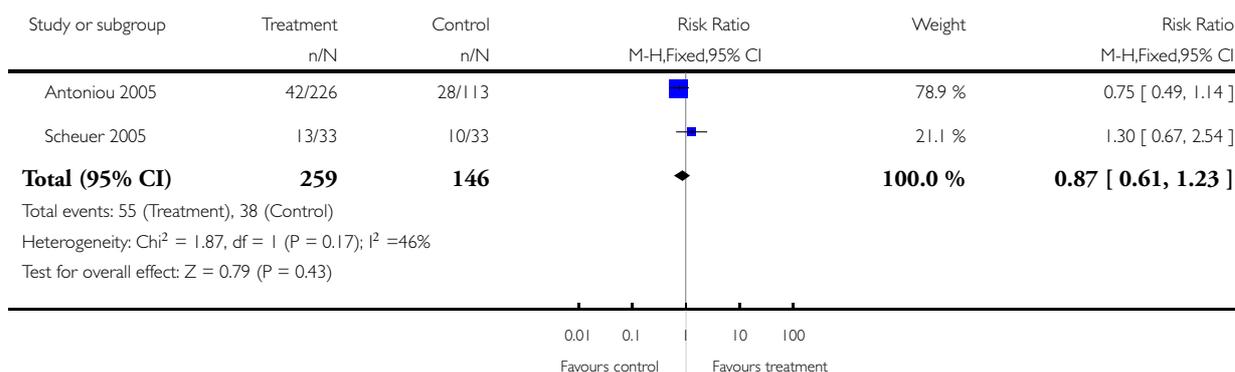


Analysis 10.2. Comparison 10 Electrostimulation vs sham stimulation, Outcome 2 Smoking cessation - late.

Review: Acupuncture and related interventions for smoking cessation

Comparison: 10 Electrostimulation vs sham stimulation

Outcome: 2 Smoking cessation - late



FEEDBACK

Comment from Nguyen and colleagues (August 2002)

Summary

1. We wish to inform you of a randomized controlled trial (RCT) eligible in the review : Vibes J. Essai thérapeutique sur le rôle de l'acupuncture dans la lutte contre le tabagisme. *Acupunct* 1977;51:13-20.

2. Three studies included in the comparison "acupuncture versus sham acupuncture" set methodological problems :

a. [Gilbey 1977](#) should be excluded. Not only because "some authors regard kidney point (used as a control) as an effective treatment for dependency", but above all because kidney ear point is used in several clinical studies for smoking cessation. For instance, in Cui review on acupuncture for smoking abstinence [1], three studies used kidney ear point [2-4].

b. [Lamontagne 1980](#) should also be excluded. "Acupuncture therapy for relaxation" as control cannot be considered as sham acupuncture. That intervention uses point ST36, also used in one study of Cui review [5] and in one RCT [6] included in the meta-analysis. Vibes RCT tests ST36, LV3, LI4 GB8, presented as "equilibrating and/or antitoxic general acting intervention". That acupuncture intervention revealed to be superior to sham acupuncture.

c. In Martin 1981(a), there is discrepancy between the control group (and the total size) in the table "characteristics of included studies" and the data used in the graph : the selected control group is in fact the group "P + stimulation" of the original study. This group includes electro-acupuncture at LI4 and "tongue" ear point. For the same motives as in the two previous studies, this control group cannot be chosen as sham acupuncture. LI4 is used in two studies in Cui review [5,7], in two RCT included in the meta-analysis [8,9] and in Vibes study.

From a general point of view, it seems inadequate to select as sham acupuncture interventions using points employed in clinical studies dealing with the same disease. This criterion (a practical and effective use of a point) is stronger than the theoretical expert opinion, and should lead to exclude these studies in a comparison acupuncture versus sham acupuncture.

3. In the comparison "acupuncture versus sham acupuncture-early", [Waite 1998](#) trial is omitted without explanation. This trial has data non biochemically validated available at two weeks, that seem to meet the criteria of the review.

4. We also draw your attention to the problematic data following :

a. in Parker 1977(a) and (b), the data to be selected for the size of groups seem to be the concordant ones appearing in the text and figure I (Parker (a) 18 patients: 9 for acupuncture, 9 for sham; Parker (b) 23 patients: 11 for acupuncture, 12 for sham) and not data in table 1.

b. In the comparison "01 -Acupuncture versus sham acupuncture, 01 -smoking cessation early": He 1997 8/26 in acupuncture group, not 7/26.

5. In references, Lagrue 1977 is in fact Lagrue 1980.

6. Pickworth 1997 trial uses "the application of electrical currents from surface electrode...placed on each mastoid process". The authors don't identify any acupuncture points, never use the word "acupuncture" and don't mention any acupuncture study in bibliography. For that motives, including this type of studies in a review "Acupuncture for smoking cessation" seems inadequate.

From remarks 1-4, comparison "acupuncture versus sham acupuncture" should be reconsidered.

1- Cui M. Advances in studies on acupuncture abstinence. *J Trad Chin Med* 1995;15(4):301-7.

2- Cai ZM. [Ear points arousing propagated sensation for stopping smoking in Senegal]. *Fujian J Trad Chin Med* 1986;17(5):22-4.

3- Li GJ. [33 cases of smoking cessation treated with ear point pressure]. *Jianxi J Trad Chin Med* 1990;21(4):40.

4- Requena Y, Michel D, Fabre J, Pernice C, Nguyen J. Smoking withdrawal therapy by acupuncture. *Am J Acupunct* 1980;8(1):57-63.

5- Sacks LL. Drug addiction, alcoholism, smoking, obesity treated by auricular staplepuncture. *Am J Acupunct* 1975;3(2):147-151.

6- Vandevenne A, Rempp M, Burghard G, Kuntzmann Y, Jung F. Etude de l'action spécifique de l'acupuncture dans la cure de sevrage tabagique. *Sem H^p Paris* 1985;61(29):2155-60.

7- Cheung CKT. Acupuncture treatment and the preventive applications for cigarette smokers. in: *Compilation of the abstracts of acupuncture and moxibustion papers. Proceedings of the 1st World Conference on Acupuncture-Moxibustion. 1987 Nov 22-26:Beijing,China.* p.76-7.

8- Steiner RP, Hay DI, Davis AW. Acupuncture therapy for the treatment of tobacco smoking addiction. *Am J Chin Med* 1982;10(1-4):107-21.

9- Labadie JC, Dones JP, Gachie JP, Freour P, Perchoc S, Huynh-Van-Thao JP. Désintoxication tabagique : acupuncture et traitement médical. Résultats comparés à 1 an sur 130 cas. *Gaz Med Fr* 1983;90(29):2741-7.

I certify that I have no affiliations with or involvement in any organisation or entity with a direct financial interest in the subject matter of my criticisms.

Reply

We are grateful to Dr Nguyen for his detailed comments.

1. Thank you for information about this trial of which we were unaware. We shall consider it for inclusion in the next review.

2. The question of appropriate and inappropriate controls runs through the whole of acupuncture research and will not be satisfactorily solved until 'Phase I & II' type studies are conducted. Without hard data, therefore, we took the pragmatic decision to accept each original author's view of what was an acceptable control. We feel it would be wrong to overturn the author's view of the sham, often very well considered and referenced, without strong reason to do so. We acknowledge that this might result in reducing the effect size for acupuncture. However, there are other biases affecting the same issue, such as the psychological equivalence of the sham control (e.g. do acupuncture studs placed in the knee have an equal psychological effect to those in the ear?). The question of whether 'acupuncture for relaxation' was an inactive control was problematic; however, there are many ways of producing 'relaxation' none of which is known to have any benefit in smoking cessation. On balance, then, we decided to keep this group in the analysis.

3. Thank you for pointing out the review omits some data reported in the Waite trial at 2 weeks. I have checked our extraction records and find that neither of the reviewers involved extracted these data, and I guess this is probably because they are only referred to very indirectly in the text, in comparison to the validated data. We therefore did not discuss whether these data are admissible. We note that they were obtained by telephone, and subsequently in the same trial, 2 out of 7 who claimed on the telephone to have stopped smoking actually were still smoking. It seems probably that all verbal reports of smoking are subject to error, but those made face-to-face may be more reliable than those made over the telephone; we shall discuss whether to include the latter in the next revision.

4.a) there is a clear discrepancy in group sizes in the report by Parker. We shall reconsider these extracted data at the next revision.

b) In the report by He, although 8 subjects reported smoking cessation, only 7 were confirmed biochemically (see 'Tobacco consumption versus cotinine concentration').

5. Thank you, we shall correct this in the next revision.

6. At the time of our 2nd revision conducted earlier this year, the Cochrane Group recommended including other stimulation techniques, on the basis that they should be reviewed and did not have any other natural home. We did not consider changing the review's title, but will consider this for the next revision. Thank you for the suggestion.

A R White, H Rampes, E Ernst

Contributors

Johan Nguyen (Marseilles France), Philippe Castera (Bordeaux, France), Jean-Luc Gerlier (Annecy, France)

WHAT'S NEW

Last assessed as up-to-date: 23 November 2010.

Date	Event	Description
13 April 2011	Amended	Graph labels corrected (reversed) for Figure 4/Analysis 3.1, Analysis 4.1, Analysis 6 & Analysis 10.2

HISTORY

Protocol first published: Issue 1, 1997

Review first published: Issue 1, 1997

Date	Event	Description
24 November 2010	New search has been performed	<ul style="list-style-type: none">• The review now includes studies found on searches of Chinese databases• Nine new studies are included: two each for acupuncture, acupressure, and laser, and three electrostimulation; two were in Chinese• The Cochrane recommended 'Risk of Bias' method is now applied• We revised the way we dealt with studies in which acupuncture was used as an adjunct to other interventions, now including these in the main analysis (we thus reverted to the original protocol)• New table comparing acupuncture with interventions of unknown effect• The analysis method is changed from odds ratio to risk ratio• Text has been revised: consideration of Chinese and Western approaches to acupuncture and the implications for research; Results and Discussion rewritten to encompass new data
23 November 2010	New citation required but conclusions have not changed	A Chinese author has joined the review team
17 June 2008	Amended	Converted to new review format.

(Continued)

24 October 2005	New citation required but conclusions have not changed	Title changed to include techniques related to acupuncture. Two newly discovered study included (Bier 2002; Vibes 1977). Outcome time-points now limited to two: immediately after treatment, and last from 6 months up to one year. Studies in which acupuncture is used as an adjunct (to NRT or counselling) are now analysed separately. Comparisons modified: acupuncture now compared to other effective interventions (NRT, counselling) separately, and no longer compared with interventions of no known effect. The Mantel-Haenzel method now used for primary method for combining studies. Subgroup analyses performed excluding studies in which the control intervention included points used as active in other studies. Analysis comparing the effectiveness of different styles of intervention is now limited to direct comparisons.
18 February 2002	New citation required but conclusions have not changed	Inclusion criteria for studies have been widened to cover acupressure, laser therapy, and cranial electrostimulation; which are stimulation therapies related to acupuncture and used for smoking cessation. The age limit for study participants has been removed to increase the relevance of the review.

CONTRIBUTIONS OF AUTHORS

AW, HR, JL and LS extracted data. AW drafted the review with intellectual contributions and textual revisions by all other authors.

DECLARATIONS OF INTEREST

AW is author of two trials included in this review, and is in part-time private acupuncture practice; he received no financial support from any commercial entity.

JL, LS, HR and JC have no conflict of interest.

SOURCES OF SUPPORT

Internal sources

- General Practice & Primary Care, Peninsula Medical School, Universities of Exeter and Plymouth, UK.
- NAFKAM National Research Centre for Complementary Medicine, Tromsø, Norway.

Part of 2010 update conducted by AW while funded by NAFKAM

External sources

- NHS Research and Development National Cancer Programme, England, UK.
- Adrian White is supported by the DH National Coordinating Centre for Research Capacity Development, UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Risk ratio used instead of odds ratio.

NOTES

Comments were received from Dr Nguyen and colleagues 5/8/2002; these, together with the authors' response, are included in the feedback section of the review. All consequent changes have been incorporated in the current update (2006, Issue 1).

Two new trials were added for the 2005 update, but conclusions remained unchanged.

INDEX TERMS

Medical Subject Headings (MeSH)

*Acupuncture Therapy; Acupressure; Electric Stimulation Therapy; Laser Therapy; Randomized Controlled Trials as Topic; Smoking [*therapy]; Smoking Cessation [*methods]

MeSH check words

Humans