

BRIEFING PAPER No 7

Substance Abuse and Acupuncture

The evidence for effectiveness



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The Evidence Series of Briefing Papers aims to provide a review of the key papers in the literature, which provide evidence of the effectiveness of acupuncture in the treatment of specific conditions. The sources of evidence will be clearly identified ranging from clinical trials, outcome studies and case studies. In particular this series of briefing papers will seek to present, discuss and critically evaluate the evidence.

SUBSTANCE ABUSE AND ACUPUNCTURE: THE EVIDENCE FOR EFFECTIVENESS

Summary

This briefing paper summarises the evidence for the effectiveness of acupuncture in substance misuse – drugs, smoking and alcohol, restricting itself mainly to controlled clinical studies. Although research on the effectiveness of acupuncture for drug misuse is still at an early stage, the evidence is encouraging. Sufficient early trial and empirical findings suggest that there are positive treatment effects. Indeed, the use of acupuncture is popular and the method documented as quick, safe and potentially valuable as an addition to addiction services (1,2). However, methodological weaknesses in most of the research leave the specific effects of the treatment still open to question. The evidence with respect to alcohol addiction is much less substantial, though on the whole positive; for smoking, the many trials have served to highlight how different interpretations of the same data can result in conflicting conclusions. Further research is essential, and a consensus needs to be reached on how trials should be conducted and how acupuncture can be best incorporated into comprehensive substance abuse programmes.

Introduction

Both traditional whole body acupuncture and auricular acupuncture have been used to treat people who have problems with addictions to drugs, alcohol and cigarettes. The use of auricular acupuncture in treating acute drug withdrawal is relatively recent, with Wen and Cheung in Hong Kong in 1973 (3,4,5) first describing the effects of acupuncture in alleviating the severity of opiate withdrawal symptoms. The practical application of acupuncture in the traditional drug treatment setting evolved at New York's City Lincoln Hospital during the 1970's.(6) As a result, many acupuncture programs based on the Lincoln protocol were established world wide in a variety of settings. The work was extended to the treatment of other substance misuse disorders such as addiction to cigarettes and alcohol.

The Lincoln protocol is relatively simple. Five small needles (shenmen, 'sympathetic' 'kidney', 'liver' and 'lung' on each ear) (7) are inserted at points regarded as specific for chemical dependency (8,9). Many acupuncturists do not restrict themselves to ear points, but use certain body points as well. The technique aims to relieve withdrawal symptoms and craving and to improve general relaxation and mental and physical functioning. Treatments last 30-40 minutes and client progress is monitored by regular urine analysis. Acupuncture treatment offers the client support during acute and post acute withdrawal through the relief of classic symptoms. Up to 50 people can be treated in one hour and the programme has claimed considerable success in retaining difficult to treat drug users i.e. out of 1,500 crack

clients between 1986-1988, more than 80% were retained after their first treatment (Lincoln Hospital unpublished 1988).

In 1985, the National Acupuncture Detoxification Association (NADA) was formed. The organisation was to assist practitioners to acquire the skills to develop Drug and Alcohol programmes. The NADA approach, incorporating auricular acupuncture, was introduced into the UK by John Tindall and is currently used in various drug agencies, particularly in London e.g. Core Trust, Angel Drug Project, City Roads and the Stockwell Project.

In October 1991, the National Institute on Drug Abuse sponsored a technical review to discuss the efficacy of acupuncture for the treatment of substance abuse (10). The current status of research and directions for future study were discussed. It was agreed that although potentially useful, studies provided equivocal results because of design, sample size and other factors and that further research was needed. However, it was felt that acupuncture was a safe, effective and inexpensive treatment for addictive diseases, being easily administered and producing significant results.

Literature Search

A search was made on ARRCBASE and Medline using the key words addict*, detox*, substance abuse, substance dependence, narcotic dependence, alcohol, smoking and tobacco and further literature was retrieved from the references identified in the publications obtained. In all, 100 references were identified concerning use of acupuncture and substance misuse. ARRCBASE is a specialist acupuncture database built up by the Acupuncture Research Resource Centre. The database contains articles relevant to Chinese Medicine and acupuncture from the British Library's AMED (Alternative Medicine Database) and the American Medline databases. Of the references retrieved, papers were excluded for one of the following reasons: they were in a foreign language, were predominantly related to treatment and not treatment evaluation, they did not involve insertion of needles (11-14) and one article (15) was published twice. Studies were included in the evidence review if they met the following criteria: human subjects addicted to either drugs (13 studies included), cigarette smoking (20 studies included) or alcohol (4 studies included), a reference/control group was used (i.e. controlled trial design), and needles, press needles, staples or electro acupuncture were used in the acupuncture treatment. In addition, a total of 27 review articles were retrieved which commented on various studies.

Selected studies are summarised in tables 1 (drugs), 2 (tobacco) and 3 (alcohol).

Drug Misuse

Introduction

Drug treatment can be divided into the stages of detoxification, rehabilitation and relapse prevention. Acupuncture has been used for all stages of drug treatment. Detoxification refers to the initial phase when a client is experiencing the direct effects of drug tolerance associated with chronic drug use. The therapeutic goals are to counteract the effects of drug withdrawal and return the individual to a relatively 'neutral' or 'normal physiological state. This stage usually requires approximately 3 to 7 days of treatment (2). Rehabilitation is the

second stage of treatment for substance dependence and begins after detoxification. This involves a combination of procedures designed to educate the patient about the negative effects of drugs and alcohol, motivate the individual to admit the substance abuse is a problem and to develop effective strategies for sustained behavioural change. This stage varies in duration and treatment setting from 15-90 days or more. Relapse prevention is the third stage of treatment and begins near the rehabilitation phase. The goals are to maintain the gains achieved in earlier phases of treatment and to develop strategies for resisting the temptation to use drugs in the future (10). The greatest challenge in the treatment of substance abuse is relapse (its prevention and management) (1). There is much anecdotal evidence in the literature for acupuncture's success in almost all drug addicted clients at almost all stages of treatment. For detoxification, acupuncture has been used to relieve physical symptoms of withdrawal. During the rehabilitation phase, acupuncture is used to reduce dysphoria and induce a general state of relaxation. For relapse prevention, it has been used to encourage relaxation and relieve or prevent symptoms of drug craving (10).

Specific Studies

In Wen's initial studies on acupuncture and substance abuse, opium addicts receiving electro acupuncture as post surgical analgesia experienced relief from withdrawal symptoms (3,4). Subsequent studies used electro acupuncture and naloxone (analgesic medication) and the patient adjusted the stimulation themselves (16). At one-year follow up, 51% of the subjects in the treatment group were drug free. The number of treatments varied according to the needs and responses of the individual patients and relief of withdrawal symptoms was commonly found. The research methods, however, lacked rigour. Pomerantz reported five successful replications of Wen's findings (17). Smith's research in the late 1970's resulted in establishing the standard for treatment due to his reported clinical experience with many cases (8).

Cocaine

In a six-week, single-blind study of acupuncture for cocaine dependence in methadone maintained patients, 40 patients were randomly assigned to receive daily acupuncture at three auricular sites and one body site (Li4), or at control sites within 2-3 mm of the four active sites (18). Cocaine use decreased significantly for patients in both groups. The only statistical difference between the two types of needle puncture was on ratings of cravings and calculations suggested that very large sample sizes would be required to detect treatment differences. In a prior study, Margolin et al (1993) had used a single-blind study design (n=48) to compare the sensations experienced when needles were inserted into sham and real auricular acupuncture points (19). Both ears were needled, one in sham sites and the other in active sites for cocaine addiction. Subjects completed a questionnaire rating the sensations in the ear and identifying which ear had received real acupuncture. Real points were perceived as more painful than sham points but this outcome was just as likely to have arisen by chance.

The effect of auricular acupuncture in reducing cocaine/crack craving and consumption was examined via a single-blind, placebo trial of 150 people seeking treatment (20) for cocaine addiction. Lipton et al (1994) suggested that counselling should have been included in order to affect the psychosocial factors that may lead to relapse. Patients were randomly assigned to experimental or placebo acupuncture treatments which were provided in an outpatient setting

for one month. Placebo treatments involved needle insertion at points not used for drug treatment. Outcome measures included reported drug use, attendance, urine drug screens and an Addiction Severity Index measured at each treatment session. Within a two-week period, the treatment group had significantly lower levels of cocaine in their blood relative to the control group. Treatment retention was the same for both.

Another randomised controlled trial was carried out in 1995 on 98 subjects abusing cocaine (21). The long-term effects of the five needle NADA protocol was superior to the effects of a one needle auricular treatment. The study also demonstrated the benefits of using an integrated treatment approach within such a programme.

Otto et al, in 1998, conducted a single-blind study of auricular acupuncture with 36 cocaine dependent in-patients in a substance abuse treatment unit, to determine whether the treatment could help reduce craving, increase treatment retention and prevent relapse (22). There was regular assessment of both treatment and control groups, but the study failed to show a significant difference even though the group receiving acupuncture remained in treatment longer than those who received no acupuncture.

In 1999, the treatment of cocaine addiction using a single-blind, randomised, placebo-controlled design was evaluated using two linked but concurrent studies. The first one randomised 236 residential clients into three groups, true acupuncture, sham acupuncture and conventional treatment without acupuncture (23). The treatment group received acupuncture at three points considered to be specific for substance abuse. Control subjects were treated with three non-specific sham points. The second study randomised 202 day patients into one of three dose levels of true acupuncture (28,16 or 8 treatments). Subjects received acupuncture at five rather than three specific ear points. Sham points were not used in the second study. The data failed to show any significant treatment differences between the three groups in the first study and no differences among the three dose levels of true acupuncture in the second study. However, relative to pre-treatment usage, groups in both studies reported a significant decrease in cocaine consumption.

Heroin

One of the first trials was carried out by Wen and Teo and compared drug abstinence in an ear acupuncture group and a methadone group. The acupuncture group was nearly twice as likely to be free of drugs at one year but no statistics were provided (16).

Man and Chuang in 1980 employed controlled trial methodology to compare electro acupuncture and methadone, but failed to say whether assignment to the two treatments was randomised (24). Withdrawal symptoms were assessed, but with an 83% dropout rate follow up assessment was abandoned.

In an electroacupuncture study by Newmeyer et al subjects were allowed to pick the treatment they wanted; acupuncture or medication or both.(25) A questionnaire profiling subjects' mood states was given several times during the trial. There were fewer withdrawal symptoms in the acupuncture group related to pain and psychological states such as depression, irritability or anxiety. There was also less evidence of drug use in the urine screens in this group.

Clark's opiate detoxification trial compared acupuncture with methadone and failed to produce a significant difference between the two groups, although the acupuncture group was more likely to have drug free urine at 90 day follow up (26).

Geijer (1987) compared treatment outcomes with 65 incarcerated, opiate addicted individuals randomly assigned to methadone detoxification with acupuncture or methadone alone. (31) Significantly fewer withdrawal symptoms were reported by the acupuncture group, who also reported they smoked less (98% compared with 35% of the methadone only group). Note that no placebo acupuncture control condition was used and the reduced withdrawal symptoms could have been due to a placebo effect.

A controlled study of detoxification for addiction to heroin randomly assigned 100 addicted persons in a single-blind design (27) to the standard auricular acupuncture treatment used for addiction, or to a sham acupuncture treatment with points that were geographically close to the standard points. Attrition was high for both groups (only 20 subjects completed the study), but those assigned to the standard acupuncture treatment attended the acupuncture clinic more days, reported less heroin use, had less evidence of drug use in urine drug screens and stayed in treatment longer than those assigned to sham treatment. Self-reports of frequency of drug use suggested that those with lighter habits (those using heroin once daily or less) found the treatment modality more helpful. Although this was an encouraging preliminary study, the sample size was small and the self-report nature of the outcome measures precludes any definitive conclusions.

Multi-substance abuse

Patients with substance abuse problems admitted to a psychiatric unit over an 11-month period were offered auricular acupuncture (28). Out of 77 patients offered the treatment, 30 refused or had fewer than four treatments (control groups) and 47 had acupuncture five or more times (treatment group). The treatment group did significantly better than the control groups with 75% compliance with psychiatric/substance abuse treatment versus 20% respectively. Average inpatient stay was 22 days for the treatment group compared with 16 days for the control group. The treatment group were also more likely to stay in follow up treatment for at least four months than the control group i.e. 58% vs 26%. This study obviously has an inherent bias, due to the choice of the control group.

Review And Meta-Analysis

Ter Riet, (29) in 1990, identified 5 controlled clinical studies on heroin use (16,24,25,30, 31). Although four reported positive results (16,25,30,31), their methodological quality was rated as poor and it was felt that the research did not support the efficacy of acupuncture in the treatment of substance misuse. Reported shortcomings were: the reference groups did not all receive sham acupuncture, the patients were not blinded to the treatment, nor were they randomly allocated to their treatment groups.

Conclusion

Since Wen and Cheung's initial reports, numerous descriptive studies citing the effectiveness of acupuncture and/or electro acupuncture as a detoxification treatment for opiate addiction have appeared in the literature (32-45). Much of this research, including Wen and Cheung's (3-5) has been severely criticised in previous reviews for a variety of methodological reasons: the lack of adequate experimental controls and comparison groups (10,14,46,47), the appropriateness of selecting a placebo and the double-blind procedure (10). Following the meta analysis of Ter Riet et al 1990 (29), Brewington et al 1994 (48) conducted a comprehensive review of acupuncture treatment of substance misuse and concluded that the findings did support a role of acupuncture as an aid to treatment of substances abusers. Their review included anecdotal reports, animal studies, studies of human heroin, cocaine and alcohol users in which some form of placebo was used, comparisons of acupuncture with methadone detoxification in opiate addicts and, studies of acupuncture analgesic effects.

Although acupuncture has been incorporated as a treatment component in various drug addiction programmes for over 20 years, its efficacy has not been demonstrated in large-scale controlled trials. The critical issues to be addressed in such trials include the choice of appropriate controls, point location for needle insertion, degree of blinding and bias checks. Margolin et al 1998 have discussed these issues in their article on planning a randomised, controlled trial of acupuncture for cocaine addiction (86). However, the above studies indicate that acupuncture may produce a significant effect in terms of treatment retention when compared with sham or placebo procedures, and also that lighter users may respond better than heavy ones in attending the clinic more frequently, and over a longer time period. The limitation for many of these studies was the high attrition rate for all groups and the lack of resources to carry out long term follow up of cases. Additional research is needed to determine how best acupuncture can be incorporated into comprehensive substance abuse treatment programmes.

Smoking Cessation

Introduction

Smoking is the largest single cause of preventable death in industrialised countries (49). People who stop smoking live longer than those who continue to smoke and their risk of developing lung cancer, heart disease, stroke and respiratory illness decreases. Cigarette smoking however remains a difficult habit to break, with many smokers trying several times before they can successfully stop. As a result, assistance is sought from a wide variety of professionals.

Acupuncture is a popular treatment for smoking cessation and is believed to reduce associated withdrawal symptoms. The use of acupuncture originated from the work described above on drug addicts in Hong Kong, but the data on effectiveness are contradictory. Uncontrolled studies have suggested an effect on smoking cessation (53,50) and some investigators claim very high (61-95%) rates of success (37, 50), but often this is not based on sound methodological assessment.

Specific studies

Many of the studies on smoking cessation are not comparable (1). Protocols vary as to the location and number of needles, the frequency and duration of treatments, the method used (staples, needles, lasers, electrical stimulation) and the definition of placebo – which may itself produce treatment effects. Disregard of the severity of smoking behaviour and motivational characteristics and the lack of long term follow up and small sample sizes, are the other criticisms that have been made.

In a 1977 study 92 subjects who had smoked more than 15 cigarettes for three years were randomised into two groups, either with an indwelling needle in an ‘active point’ (lung) for one week or an indwelling needle in an ‘inactive’ auricular point (kidney) for one week (51). At one week those receiving acupuncture at the ‘active’ site were more likely to have abstained but at a three months follow up abstinence was not sustained.

In the same year, Lacroix and Besancon also used bilateral facial acupuncture, in this case, weekly for three weeks, and compared it with sham acupuncture (52). The method of randomisation was not stated in their paper, but they demonstrated a significant effect, with 74% of the acupuncture group stopping smoking compared with 29% of controls. No long-term follow up was reported.

Parker and Mok, also in 1977, compared electroacupuncture stimulation to ‘effective’ auricular points (shenmen and lung) with ‘inactive’ points (shoulder and eye) over a three week period (53). Although there were indications that the group receiving active treatment were more likely to decrease their cigarette consumption the differences failed to achieve significance.

Tan et al (1978) (54), treating patients three times a week, reported a significant decrease in cigarette smoking with laser acupuncture in a controlled trial.

In a study of 58 smokers, by MacHovec et al (1978) (55), acupuncture (using a sutured bead on the ear lobe at the acupuncture site for an indefinite time) was compared with hypnosis in individual and group sessions. Self reported smoking cessation was higher for both acupuncture and hypnosis groups compared with controls. Employed self-retained ear seeds. At six months, 25% of the subjects receiving correct site treatment were abstinent, compared with 0% with placebo points. 75% of the experimental group showed improvement (i.e. reduced use or abstinence) six months after treatment compared with 25% of the placebo group. Note that this study did not state whether subjects were randomised, nor did it present any tests of statistical significance.

A randomised trial was carried out by Lagrue in 154 smokers (56). Facial acupuncture was repeated after one week, and was compared with sham acupuncture. Although there was no significant difference between the two groups in the number of subjects achieving abstinence, there was 80% reduction in consumption at one week.

Lamontagne et al in 1980(57) compared two types of acupuncture therapy, one aimed at smoking withdrawal and the other aimed at enhancing relaxation, which made up the control group in a randomised trial. There was a decrease in cigarette use in the acupuncture group but the effect did not continue for one, three and six month follow up. This was a poor choice

of acupuncture control procedure, since the anti-smoking effect of 'relaxation' treatment cannot be ruled out.

In the first part of a two part study by Martin et al (58) 132 smokers either received three weeks of indwelling needles in 'effective' auricular points (lung and hunger) plus 20 minutes electro acupuncture to hand and ear sites, or 'ineffective' auricular points (elbow and eye). In the second part of the study 128 smokers were randomised into those receiving the 'effective' auricular points and the same 'ineffective' points. After three weeks there was no significant difference between the groups neither in either study, nor at six months follow up.

In 1982, Steiner et al carried out a randomised controlled trial in 23 subjects - people who had been smoking over 20 cigarettes/day for two consecutive years (59). Acupuncture to genuine body and ear points was given over a two-week period and compared to sham acupuncture. No significant difference in immediate cessation was observed between the two groups. Although 80% of the experimental group reported a decreased desire to smoke after treatment compared with 50% of the placebo group, the difference was not statistically significant. Again, the small sample size with this study limited its value.

The study by Cottraux in the following year recruited 558 subjects who had smoked 10 or more cigarettes for two years into a study, which compared behavioural therapy, facial acupuncture, placebo capsules and a waiting list control (60). Those in the acupuncture and behavioural therapy groups were significantly more likely to stop smoking at 15 day follow up than the placebo group, but this difference did not carry over to the 9 and 12 month follow up period.

In a randomised controlled trial of 130 smokers, acupuncture (auricular and whole body) and conventional medical treatment were compared (61). Abstinence and reduction in smoking were assessed over a 12 month follow up. There was no significant difference between the two groups for either outcome. A similar conclusion was reached by Vandevenne et al, who recruited 200 self referred smokers for a randomised controlled trial where acupuncture (three auricular and two body points) and sham acupuncture were compared (63). There were no differences in immediate cessation or at 1 year follow up. Gillams (62) used an indwelling needle (replaced every week) in 81 subjects who had been smoking more than 50 cigarettes for five years. A group of subjects with an indwelling needle in the auricular point for the lung was used for a period of four weeks, and was compared with a group with a needle placed in an 'inactive' point. Group therapy was given each week to both. At three month follow up again there was no significant difference between the groups, but this is perhaps not surprising given the 'hardened' smokers that were used.

A study by Clavel in 1985 (64) demonstrated that subjects treated with either acupuncture or nicotine gum showed a better response than a control group. However, there was no difference between the two active treatments, probably as a result of insufficient numbers. Both were effective in helping smokers to stop, and although about half of these in each group subsequently relapsed, there were still significantly more ex-smokers in the treatment groups than the control at 13 months. In a later trial, Clavel (65) failed to show the efficacy of acupuncture compared with a sham control: both groups produced cessation rates after one month of the order of 22-23%. This was a large study of 996 subjects comparing the use of nicotine chewing gum and acupuncture in a randomised controlled set-up (65). The gum treatment was significantly more effective than its control (26 v 19%). In a later 2x2

factorial design study, the same authors failed to show a difference in cessation rates between acupuncture and control and nicotine gum and control at 12 month follow up (66).

In 1991, Leung's controlled trial compared behavioural therapy with indwelling needles in auricular points in 95 subjects who had smoked for least one year. (67) Subjects were followed up at one, three and six months. The behavioural group was significantly more likely to have stopped smoking than the acupuncture or control group, but the acupuncture group was more likely to have reduced the number of cigarettes smoked.

The effects of acupuncture on smoking reduction/cessation and the specificity of points were investigated in 46 healthy men and women volunteers who wanted to stop smoking (68). Subjects were randomly assigned to one of two groups. One group was given effective acupuncture treatment (the test group) and the other given acupuncture treatment at points assumed to have no effect on smoking cessation (control group). Clinical outcomes measured included serum cotinine and serum thiocyanate, the most commonly used physiological indicators of a smoking habit. The daily cigarette consumption fell during the treatment period in both groups but the reduction was significantly greater in the test group. Altogether 31% of those in the test group had quit smoking completely at the end of the treatment compared with none in the control group. For the test group the concentrations of cotinine and thiocyanate were reduced significantly after the treatment period. For both groups the taste of tobacco worsened during the treatment period, but the effect was more pronounced for the test group than for the control group. The desire to smoke fell significantly in both groups after treatment, and the reduction was larger for the test group than for the control group. The study suggests that acupuncture may help motivated smokers to reduce their smoking or even quit altogether.

In a recent electro acupuncture study, White et al (69) observed no significant difference between the mean reduction in withdrawal symptom scores of two groups between day one and day 14 (39% in the acupuncture group and 42% in the control). At nine months, only three of those quitting at 14 days were still not smoking. The authors concluded that electro acupuncture did not have a specific effect in reducing nicotine withdrawal symptoms.

In another randomised placebo-controlled trial in 1998, 78 smokers were given a single treatment of electro acupuncture using needles at either an active or a placebo site plus self retained ear seeds for two weeks, in a general practice setting (70). The active treatment group were more likely to have stopped smoking than the placebo group at six months.

Review And Meta-Analysis

There have been several reviews and meta-analyses carried out in this field, usually analysing many of the same papers but in a different way using different acceptance criteria. A review by Schwartz (1988) (71) used seven studies to analyse a real versus sham acupuncture model involving a total of over 5000 patients, and gave cumulative results, which suggested that real acupuncture works 25% of the time. Sham acupuncture was almost equally effective; cessation rates between 20% and 25% (percentages of people abstinent for 6 months).

A meta analysis by Ter Riet et al (1990) (29) noted that the negative outcomes (51,53,56,57,58,59,60,61,62,63,72,74) exceeded by far the number of positive outcomes (52,55,73). The studies with negative outcomes were graded as methodologically superior,

indeed they concluded that the more rigorous the methodology, the more likely it was to have a negative outcome, though on the whole the research was of poor quality. A criticism is that the authors were not experts in acupuncture and may therefore have included studies that were unsatisfactory from an acupuncture point of view. In addition, their main conclusion was not that acupuncture did not work, rather that when studies involving real acupuncture and sham acupuncture were analysed, little difference could be detected between the 'real treatment' and 'placebo'. Also, they failed to consider the specificity of the point selection.

A review in 1995 argued that trials in which control subjects were needled in inappropriate sites underestimated the effects of acupuncture, since needling anywhere could trigger the release of endorphins, which aid the relief of withdrawal symptoms (75). Lewith concluded that acupuncture is as effective as nicotine replacement therapy but that the site of needle insertion does not seem to be important. He stated that the real versus sham acupuncture model is an inappropriate one to investigate the value of acupuncture in the context of smoking cessation, and that a formal meta analysis is fraught with difficulties in combining the results of disparate studies, which use different time points and techniques. He emphasised that the effects of acupuncture are equal to that of the best studies demonstrating withdrawal from smoking with a variety of nicotine replacement treatments.

A more recent review in 1997 was carried out by authors experienced in acupuncture and trial methodology, and based on a synthesis of best evidence (76). This method (77,78) employs the greatest internal and external validity using well-specified criteria. It favours effect size over statistical significance. In this review studies were included if they met the following criteria; single-blind controlled design i.e. controls receive sham acupuncture, pre-allocation concealment of randomisation, appropriate choice of control points, more than 25 subjects in each group. The outcome measure was complete sustained cessation of smoking both immediately after treatment and at the longest follow up period. Sixteen controlled trials were identified (51,52,53,54,56,57,59,60,61,62, 63,66,74). In two cases, two separate studies were reported. The analysis did not find that the 'active' types of acupuncture used were more effective than 'placebo' or 'sham' for smoking cessation. However, they also concluded that sham acupuncture was an inappropriate control, as it was likely to have some physiological effects similar to real acupuncture. If significant differences are to be shown, acupuncture trials should have larger sample sizes. Practitioner blinding was another problem identified although the study by Lagrue (52) did manage to achieve this. The authors of the review suggested that research should now be concentrated on: Is electro acupuncture more successful than simple needle acupuncture? Are other treatment schedules (e.g. different end points, repeated attendances) more effective? Does acupuncture reduce the withdrawal symptoms associated with smoking cessation?

In 1998 (amended, 1999) a Cochrane review summarised the data on acupuncture for smoking cessation (79), including a total of 20 trials (51,52,53,56,57,58,59,60,61,62,63,64, 65,66,67,68,69,70,72,74). The authors suggested that acupuncture was not superior compared with sham points for smoking cessation for any time point considered in the review (early after treatment, at six or at 12 months), though three studies produced strongly positive results (52,68,70). Similarly when acupuncture was compared with other anti-smoking interventions, there were no differences in outcome at any time point. Acupuncture appeared to be superior to 'no intervention' at early follow up but this difference was not sustained. The results with different techniques did not show any one particular method (i.e. auricular acupuncture or whole body acupuncture) to be superior to control intervention. The review concluded that acupuncture appears to act only as a placebo in smoking cessation. Future

research should concentrate on using adequate stimulation and investigating whether acupuncture can lead to a reduction in nicotine withdrawal symptoms.

Conclusion

Although acupuncture has been claimed to be of enormous value in aiding smoking cessation it is likely that this assumption is based on some of the early studies involving hard drug addiction rather than smoking. Different types of acupuncture treatments can be used, the most common being the placement of a small semi-permanent needle into an acupuncture point on the ear. Sometimes this is preceded by electro-stimulation to promote endorphin release, or body acupuncture. There is however, no physiological evidence that acupuncture relieves withdrawal symptoms. The studies described do not demonstrate that acupuncture alone aids smoking cessation but it is thought that it can be a useful technique through which this can be promoted (75). Acupuncture may act as a 'placebo procedure' to help the smoker handle the addictive component of smoking, while it is suggested that, for sustained abstinence, the psychosocial aspects of smoking must be addressed. Hence counselling or behavioural therapy may be needed alongside acupuncture and, as with any smoking cessation method, motivation to quit is necessary for continued abstinence.

Whilst this is the mainstream position amongst medical researchers there have been alternative interpretations of the evidence. Some authors have not agreed with the choice of control points used by some investigators. The 'shoulder', 'kidney' and 'eye' points are not thought to be inactive by some, and others have stated that the 'elbow' and the 'eye' points may be effective as they are innervated by the vagus nerve. Further, it has been suggested that the site of needle insertion in general is unimportant, with a non-specific triggering of endorphin release, which may help withdrawal from a number of addictions including smoking (75). It therefore follows that a real-versus sham model is an inappropriate manner in which to investigate the value of acupuncture in the context of smoking cessation. (It also follows that a simple, formulaic procedure may be just as effective as anything else). Re-analysing the trial results simply as acupuncture (whether 'active' or 'sham') versus no acupuncture indicates that its effectiveness in smoking cessation is of the order of 20-30% - as good as the recommended nicotine replacement methods (and similar to results from uncontrolled studies (87)). This size of effect holds only for the short term, but it is perhaps not unreasonable to consider initial cessation and long-term abstinence as two different outcomes, requiring different strategies. The latter may require follow-up acupuncture sessions and a more individualised regime, a proposition as yet untested by controlled research trials. Most studies have involved rather minimal amounts of treatment, while the most intensive/continuous one has produced the most compelling results (68).

Thus it seems that many more questions need to be answered before the degree of effectiveness of acupuncture for smoking can be established.

Alcohol

Introduction

Alcoholism is a major health problem in society and its effects range from being a cause of road traffic accidents to increased risk of stroke and mental health problems. There have however, been few controlled trials carried out to evaluate the effectiveness of acupuncture to treat people who have problems with alcoholism.

Specific Studies

Four controlled trials on the use of acupuncture in the treatment of alcohol misuse were identified (81,82,83,84). A randomised trial on 54 hardcore alcoholic recidivists was carried out to investigate whether sobriety could be achieved, and episodes of drinking and detoxification centre admissions reduced, as a result of therapy (81). Specific points for substance misuse were compared to non-specific points. Patients in the treatment group expressed less need for alcohol, and had fewer drinking episodes and admissions to the detoxification centre during the study than control patients. The majority of treated patients felt that acupuncture had a definite impact on their desire to drink, whereas, only a few control patients noted this effect.

A second placebo controlled study by Bullock in the USA investigated 80 severe recidivist alcoholics who received acupuncture either at points specific for the treatment of substance abuse (treatment group) or at non specific points (control group) (82). A total of 21 out of 40 of the treatment group completed the programme compared with 1 of the 40 controls. Significant treatment effects persisted at the end of the six-month follow-up and more control patients expressed a moderate to strong need for alcohol, and they had more than twice the number of both drinking episodes and admissions to a detoxification centre. The difference in effect size between true and sham acupuncture ranged from 24-36% depending on the measure used and the stage of treatment.

Worner et al (83) described a replication of Bullock's study (82). A total of 56 alcoholics, one third of whom had also reported illicit drug use were examined. Clients were allocated to one of three treatment groups, specific acupuncture, sham transdermal stimulation or standard care. They used rates of completion of treatment and detoxification as outcome measures. Results showed no significant differences across a number of criteria between the three groups. Once again this study suffered from small sample sizes (20 per group).

More recently Rampes et al in the UK carried out a 6-week single-blind randomised controlled trial to determine the effectiveness of auricular acupuncture in reducing the craving for alcohol (83). Groups were randomised to specific electro acupuncture treatment, non-specific electro acupuncture treatment or normal treatment. A significant reduction in craving was observed for both acupuncture groups and a 44% increase in craving for controls at week 8. By week 24, there were no such differences between the groups. Numbers in each arm of the study were however, small.

Review And Meta Analysis

Ter Riet's analysis (29) of two of the above studies (81,82) concluded that they were of insufficient quality and therefore interpretation was not meaningful. Although the results suggested that acupuncture may be helpful in breaking the cycle of alcohol misuse, the number of subjects was small (less than 50 per group) and the high dropout rate in the placebo group could have biased the results. In addition, the results were not validated with biochemical measures and self reported data on alcohol consumption.

Following Rampes article (84), Ter Riet carried out a second analysis based on the criteria used in the previous one and confirmed that the study did not provide evidence that electro-acupuncture was efficacious in the treatment of addiction to alcohol (85).

Conclusion

Although the studies that evaluated the use of acupuncture in treating people with alcohol problems have been limited, they have on the whole provided positive results. (Indeed, Meyer (88), in a very recent review, contends that it is only Bullock et al's alcohol studies that provide good evidence of efficacy in any area of substance abuse). There have been high dropout rates: future studies should focus on the reasons for this, and thus limit loss to follow up. The studies considered in this section are very different from each other. For example Worner et al (83) used several body points in addition to 2 ear points, Bullock used 3 ear points and a hand point (81,82). Worner used sham acupuncture but Bullock did not. Worner had a standard-care-only treatment group; Bullock's attended minimal AA style group meetings. The frequency and duration of acupuncture differed, as did the length of treatment. The sample sizes were small in both studies. Comparison of these two studies typifies the problems in summarising substance abuse acupuncture research in general. The treatments are not comparable; the study design, analysis and sample sizes differ in significant ways. The methodological inadequacies make it difficult to interpret the results, which are thought to be inconclusive when considered in the reviews and meta-analyses of the medical literature.

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Table 1. Drug misuse and acupuncture: the evidence for effectiveness

	Study	Sample size	Method	Control	Follow up	Outcome Measures	Results	Stats
1	Wen & Cheung 1973 (Opium Heroin)	40	Electro-ear acupuncture (A) Single point electrical stimulation	No control	12 mths	Withdrawal symptoms Urine analysis	Relief of withdrawal symptoms 51% drug free (A)	P<0.05
2	Avants, Margolin et al 1995 (Cocaine)	40	Ear acupuncture (A) + 1 body site 6 week course	Placebo (C)	6 wks	Retention Abstinence Urine analysis Craving	80% (A) vs 70% (C) completed treatment 44%(A) vs 29% (C) abstinence 66%(A) vs 70% (C) positive urines at end of study 0.73 (A) vs 1.77 (C) mean craving score	NS NS NS P<0.05
3	Lipton et al 1994 (Cocaine)	150	Ear acupuncture (A)	Sham points (C)	1 mth	Urine analysis Treatment retention	a) Acupuncture group at 2 wk significantly lower cocaine metabolic levels b) No significant difference at follow-up Treatment retention similar for both groups	P<0.05
4	Konefal et al 1995 (Various substances)	98	Ear acupuncture (A): 5point vs 1 point. Ear and body acupuncture. 16 wk programme x 2 visits per wk	1 needle (ear) (C)	16 wks	Urine analysis	Significant difference between single needle and 5 needle protocols. Males responded better than females. No difference between (A) and (C)	P not stated
5	Otto et al 1998 (Cocaine)	36	Ear acupuncture (A) 12 wk programme	Sham points (C)	12 mths	Craving Treatment retention	No reduction in craving High drop out rate – only 4 completed whole course	NS
6	Bullock et al 1999 a) b) (Cocaine)	236 202	Ear acupuncture (A) 8 wks (28 times) 3 different dosage regimes in 8 wks: 28,16 or 8 treatments	Sham points (C) Standard control Standard control		Craving assessment Urine analysis Addiction Severity Index SF36 Beck Depression Inventory	Craving: a) (A) significantly worse than (C) b) No differences between 3 dosage regimes	P= 0.007 NS
7	Wen & Teo 1975 (Heroin)	35	Ear Acupuncture (A)	Methadone (M)	12 months	Drug abstinence	51% (A) 29% (M) free of drugs at 1 year	None provided

Table 1 (continued)

	Study	Sample size	Method	Control	Follow up	Outcome Measures	Results	Stats
8	Man and Chuang 1980 (Opiates)	35	Electro- ear acupuncture (A) Daily treatment for one month	Methadone (M)	Discontinued	Urine analysis Withdrawal symptoms Craving	Only 3 patients in each group completed the study 83% drop out	No analysis
9	Newmeyer et al 1984 (Heroin)	132	Electro-acupuncture (A) Electro-acupuncture & medication	Medication (M)	6 mths	Urine analysis Self reported heroin use	38% (A) 48% (M) heroin positive urine after 10 treatments 24% (A) 36% (M) positive urine at 6 months Less heavy heroin use reported by acupuncture subjects	Not provided
10	Geijer 1987 (Opiates)	65	Acupuncture (A) + Methadone	Methadone (M) No placebo control	Unknown	Withdrawal symptoms Reduction in drug use	Reduction in withdrawal symptoms in acupuncture group 98% (A) 35% (C)	P<0.05
11	Clark 1990 (Opiates)	84	Ear acupuncture (A)	Methadone (M)	90 days	Urine analysis.	31% (A) 14% (M) drug free urines at follow-up 53% (A) 53% (M) with + ve urines and heroin present	NS NS
12	Washburn et al 1993 (Heroin)	100	Ear acupuncture (A)	Sham points (C)	3 wks	No. of days attended No. of days in treatment Urine analysis	4.2 (A) 2.1 (C) days attended 16 (A) 4(C) no. of days staying in treatment over 3 wks 7.3% (A) 6.7% (C) urines clean of opiates at 3 wks	P<0.05 NS NS
13	Gurevich et al 1996 (Combined substance abuse)	77	Ear acupuncture (A) (>5 treatments)	No ear acupuncture – refused offer or had <4 treatments (C)	12mths	Continuation of treatment Compliance with treatment Discharge rate Acceptance of staff's discharge recommendations Remained in FU for at least 4 mths Average inpatient stay Immediate relapse	75% (A) 20% (C) 2% (A) 40% (C) 77% (A) 37% (C) 58% (A) 26% (C) 22days(A) 16days (C) 19% (A) 27% (C)	

*A acupuncture M methadone C control

NS = (statistically) non-significant

Table 2.

Smoking cessation and acupuncture: the evidence for effectiveness

	Study	Sample size	Method	Control	Follow up	Outcome Measures	Results	Stats
1	Lacroix & Besancon 1977	117	Facial acupuncture (A) 1 per wk x 3 wks	Sham points (C)	3 wks	Abstinence	74% (A) 29% (C) immediate cessation	P<0.01
2	Gilbey 1977	92	Ear acupuncture with press needle (self stimulated) (A)	Sham points – press needle (C)	3 mths	Smoking cessation	36% (A) 33% (C) immediate 20% (A) 15% (C) at follow up	NS
3	Parker & Mok 1977	41	Electro-acupuncture (A) Press needle (A) 2 per wk x 3 wks	Sham electro-acupuncture (C) Sham acupuncture (C)	6 wks	Decrease in cigarette smoking	Ear acupuncture 18% (A) 8% (C) Press needle 30% (A) 20% (C)	NS
4	Tan & Huang 1978	104	Laser acupuncture (A) 3 per wk x 2 wks	Laser probe near skin (C)	None	Decrease in cigarette smoking	75-100% reduction in smoking in acupuncture group	Sig
5	MacHovec & Man 1978	58	Sutured plastic bead at acupuncture site (A) Single treatment	Hypnosis Group hypnosis Sham points (C)	6 mths	Abstinence Improvement	25% (A) 0% (C) 75% (A) 25% (C)	None given
6	Lagruet et al 1980	154	Facial acupuncture (A) 1 per wk x 2 wks	Sham points (C)	None	Abstinence Reduction in smoking	44% (A) 40% (C) immediate cessation 80% reduction at 1 wk	NS
7	Lamontagne et al 1980	75	Ear acupuncture (A) 1 per wk x 2 wks	Acupuncture for relaxation (C)	6 mths	Reduction in smoking	29% (A) 36% (C) immediate cessation 8% (A) 16% (C) at follow up	P<0.05
8	Martin & Waite 1981	260	Indwelling ear needles + electro-acupuncture (A) 1 treatment	Sham ear points (C)	6 mths	Abstinence and reduction	16% (A) 27% (C) immediate cessation 12% (A) 10% (C) at follow up	NS
9	Steiner et al 1982	32	Ear and body acupuncture (A) 2 per wk x 2 wks	Sham acupuncture (C)	4 wks	Abstinence Decrease in desire to smoke	Immediate cessation: 9% (A) 9% (C) 80% (A) 50% (C)	NS NS
10	Cottraux et al 1983	558	Facial acupuncture (A) 3 per wk x 1 wk	Behaviour therapy Untreated control (C) Placebo capsule x 3	12 mths	Abstinence	21% (A) 8% (C) at 2 wks 16% (A) 7% (C) at follow up	P<0.05 NS

Table 2 (continued)

	Study	Sample size	Method	Control	Follow up	Outcome Measures	Results	Stats
11	Labadie 1983	130	Ear and whole body acupuncture (A) 1 treatment (possibly more)	Drugs (tranquillisers, detox agents) (C)	12 mths	Cessation at follow up Reduction in smoking	32% (A) 31% (C) 16% (A) 11% (C)	NS
12	Gillams et al 1984	81	Press needle + group therapy (A) 1 per wk x 4 wks	Press needle in wrong point + group therapy (C)	3 mths	Abstinence	32% (A) 30% (C) immediate cessation 18% (A) 15% (C) at follow up	NS
13	Vandevenne et al 1985	200	Face and body points (A) 4 treatments over 3 wks	Sham points (C)	1 yr	Abstinence	37% (A) 33% (C) immediate cessation 20% (A) 15% (C) at follow up	NS
14	Clavel et al 1985	651	Facial acupuncture (A) 1 treatment only Nicotine gum (G)	Sham points (C) + Group therapy	13mths	Cessation rate Carbon monoxide	19% (A) 22% (G) 8% (C) at 1 mth 8%(A) 12% (G) 3% (C) at 13 mths	P=0.0001 P=0.002
15	Clavel and Paoletti 1990	996	Acupuncture (A) Nicotine gum (G) 3 treatments over 1 mth	Sham points (C) Placebo gum (C)	1 mth	Cessation rate	22% (A) 23% (C) 26% (G) 19% (C)	NS P<0.05
16	Leung 1991	95	Press needles (A)	Behavioural therapy (B) Control group (C)	6mths	Abstinence Daily consumption	16% (A) 33% (B) 4% (C) 2% (A) 35% (B) 90% (C)	P<0.001 P<0.001
17	He et al 1997	46	Specific acupuncture points - body, ear + ear pressure (A) 2 per wk x 3 wks	Sham points (C)		Serum cotinine/thiocyanate Taste/desire Smoking cessation	Both reduced Worse/less 31% (A) 0% (C)	P<0.001 <.05/<.001 P<0.002
18	White et al 1998	76	Electro-ear acupuncture (A) on days 1, 3 and 7	Sham points (C)	9 mths	Cessation Reduction in withdrawal symptoms	No difference (A) and (C) at 9 mths 39% (A) 42% (C) at 2 wks	NS NS
19	Waite & Clough 1998	78	Electro-acupuncture + ear seeds (A) 2 wks	Placebo site + ear seeds (C)	6 mths	Smoking cessation	12.5% (A) 0% (C) ceased smoking at 6 mths	P=0.055

*A acupuncture C control G gum B behavioural therapy

NS = (statistically) non-significant

Table 3.

Alcohol misuse and acupuncture: the evidence for effectiveness

	Study	Sample size	Method	Control	Follow up	Outcome Measures	Results	Statistical significance
1	Bullock et al 1987	54	Acupuncture 2½ mth period	Sham points	2½ mths	Programme attendance Self reported need for alcohol	Fewer self reported drinking episodes and reduction in “desire to drink” in acupuncture group Reduction in admissions to local detox unit.	P<0.05
2	Bullock et al 1989	80	Acupuncture 2months (A)	Sham points (C)	6 mths	Number of completed treatment programmes Number feeling indifferent to alcohol at 6 mths Number of drinking episodes at 6 mths Number abstinent at 6 mths Admissions to detox unit Job applications made	More completions: 21/40 (A) 1/40 (C) self reported Less need for alcohol: 22 (A) 10(C) Fewer drinking: 100 (A) 241 (C) Greater abstinence: 12 (A) 4(C) Fewer admissions: 0.69 (A) 1.56 (C) 75% (A) 45%(C)	P<0.01 P<0.01 P<0.05 P<0.05
3	Worner 1992	56	Acupuncture (body and ear) 3mths (A)	Transdermal stimulation Standard care (C)	6mths	Treatment retention Relapse rate No. admissions to inpatient detoxification unit	Figures not reported	NS
4	Rampes et al 1997	59	Electro-acupuncture (A) 6 treatments, 1 per week	Sham points (AS) Standard care (C)	6 mths	Craving for alcohol Severity of alcohol dependence questionnaire Mean cell volume and glutamyl transferase	Wk 8: reduced 60% (A) 54% (AS) increased 44% (C) Wk 24: all 3 groups low craving Reduced anxiety scores for (A) at week 8, not at week 24	NS NS NS

* A acupuncture AS sham acupuncture C control

NS = (statistically) non-significant