

Alternative therapies for tobacco dependence

Lynn M. Villano, MSN, NP^{a,*}, Adrian R. White, MD^b

^a*Center for Tobacco Control, North Shore Long Island Jewish Health System,
225 Community Drive, South Entrance, Great Neck, NY 11021, USA*

^b*Peninsula Medical School, Universities of Exeter and Plymouth, ITTC Building,
Tamar Science Park, Plymouth, PL6 8BX, UK*

Alternative and complementary medicine refers to a range of therapies that extend the practice of conventional medicine and are increasingly used by patients in the west. Whether they will be accepted and integrated into mainstream medicine will depend on the evidence that they are safe and effective. This evidence should be provided by the same investigative methods and to the same standards as conventional medicine, such as blinded randomised controlled trials. However, in some circumstances these may be difficult to achieve either for technical reasons such as finding an appropriate placebo control for the acupuncture needle, or for theoretical reasons such as permitting the therapist to individualise the treatment which is considered essential for good results. The complementary therapies that are most frequently given by therapists to assist smoking cessation are acupuncture and hypnotherapy. In this article, these therapies are described and the evidence of their effectiveness considered.

Acupuncture

Background

Different acupuncture techniques have been developed for treating addictions in three separate medical environments. The first, traditional Chinese acupuncture, involves treating body points by insertion of needles for about 20 minutes, repeated several times a week and sometimes daily. The needles generate a sensation called “de qi,” which is heaviness and numbness rather than pain. This therapy has long been used in China for

* Corresponding author.

E-mail address: Lvillano@nshs.edu (L.M. Villano).

treating opium dependence, often combined with herbs, and is still used [1] for nicotine addiction. The underlying theory of this approach rests on the concept that the needles influence the fundamental energy of the smoker, which leads to changes of motivation and self-worth. There is some evidence for psychologic changes in chronic pain patients after they have been treated with acupuncture [2].

The second approach, auricular acupuncture using points in one or both pinnae, was developed by a French physician [3]. He believed that different parts of the body are represented on the ear in the form of a homunculus, and that needling the ear has an effect on the corresponding part of the body. Although it may seem extraordinary to scientifically trained doctors that there could be an association between the ear and other parts of the body, it should be noted that there is some supporting evidence for the idea from blinded diagnostic studies [4–6]. One possible basis for an association could be the fact that the vagus nerve innervates part of the ear, mainly the cavum conchae and this is where charts indicate the locations that correspond with the internal organs. The concept of ear acupuncture was adopted enthusiastically by the Chinese, who incorporated the points representing internal organs into their traditional treatments. For treating addictions, they mainly used the points named “Shenmen,” translated as “gate of the mind” and the “lung” point [1].

The use of ear acupuncture for drug withdrawal was boosted by a serendipitous observation in the early 1970s, at a time of widespread interest in electroacupuncture (EA) for surgical analgesia [7]. In Hong Kong, some patients undergoing neurosurgery were given original EA at the lung points for pain relief. During the postoperative phase, some of those patients who had been smoking opium before admission to hospital did not experience the withdrawal symptoms that they anticipated. They attributed this welcome relief to having received the EA. In a subsequent controlled trial in 70 opioid addicts, auricular EA proved superior to methadone for long-term abstinence from opioids [8]. When this report became widely disseminated, anecdotal reports from many countries followed, suggesting that auricular acupuncture with electrical stimulation could reduce withdrawal symptoms [9] and facilitate the addicts’ cooperation in other therapies [10,11].

In the United States, auricular treatment gradually evolved with clinical experience, and eventually developed into a form of acupuncture using five points bilaterally. Only manual stimulation is used, the original EA being omitted on the strength of clinical observations [12]. This method is now promoted by the National Acupuncture Detoxification Association [13]. Acupuncture is an option available to justices when sentencing heroin addicts, although it is important to recognize that acupuncture is best used only as part of a multi-approach program, not as a sole therapy.

In the National Acupuncture Detoxification Association protocol, auricular acupuncture is given daily or on demand, with the aim of

reducing withdrawal symptoms. It is possible to continue the auricular stimulation during the withdrawal period by inserting small needles shaped like thumb-tacks, from which a small projection of about 2 mm rests in the skin of the pinna. Smokers are instructed to apply pressure when they feel cravings. These act as a foreign body increasing the risk of local infection of the cartilage, which can be serious and may also produce a bacteremia that has been known to cause endocarditis in susceptible patients [14,15]. Some acupuncturists have used a surgical staple [16] or suture [17,18], but there are no recent reports of these rather adventurous methods. More commonly, the stimulation is maintained by pressure from a *Vaccaria* seed (*Semen vaccariae* [1]), or from a small stainless steel bead.

The third acupuncture technique for addictions is strikingly different, and widely reported from France. Points in the face near the external orifices are used, particularly nose and mouth. This approach was first reported by Soulié de Morant, the French diplomat to the far east, and described in the scientific literature by subsequent authors, particularly Poupy [19].

Possible mechanisms for an acupuncture effect in smoking

Literature searches have failed to uncover any studies on the mechanism of acupuncture's possible role in nicotine withdrawal. A few isolated studies in opioid withdrawal that are possibly relevant are summarized here.

Three events coincided in the mid-1970s: (1) the discovery of endorphins (now called *opioid peptides*) [20]; (2) acupuncture's effect on neurotransmitters [21]; and (3) the role of EA in heroin dependence [8,22]. Theories of acupuncture's role in opioid dependence followed: (exogenous) opioids that are taken by the addict inhibit the hypothalamus from releasing endogenous opioids, by negative feedback. Simultaneously, enzyme induction increases the rate of metabolic breakdown of opioids, and so increases tolerance, leading to increased demand and higher dosage. When the addict suddenly stops taking the drug, they experience withdrawal symptoms, which are caused by the absence of opioids, and generally in the opposite direction to opioid effects (eg, diarrhea rather than constipation). Withdrawal symptoms continue until the hypothalamus can recover its ability to release opioids. The speculative role of acupuncture is to stimulate the release of endogenous opioids from the hypothalamus and thereby reduce withdrawal symptoms. For want of any other explanation, this mechanism was also used as a model for nicotine addiction.

In support of this model, Clement-Jones et al [23,24] measured opioid peptide concentrations in heroin addicts given EA. The mean cerebrospinal fluid concentration of met-enkephalin was significantly lower than normal and increased after EA, in line with relief of withdrawal symptoms. The cerebrospinal fluid concentrations of β -endorphin were higher than normal but did not change after EA. This suggests that EA reduces withdrawal symptoms by the release of met-enkephalin but not β -endorphin. In support

of this, another randomized controlled trial (RCT) found that the success of acupuncture in reducing cigarette consumption in students was not affected by giving naloxone (which blocks the effect of β -endorphin but not met-enkephalin) [25].

This model was also supported by some isolated laboratory experiments, but not by a sustained research program: auricular EA produced a significant reduction in withdrawal symptoms in rats [26] and in mice [27]. Some studies found that high-frequency EA, which preferentially releases met-enkephalin, was much more effective than low-frequency EA at reducing withdrawal symptoms [8,28]. Other studies, however, found effects with low-frequency EA (releasing β -endorphin) [26]. This inconsistency may be caused by species differences, or by a lack of complete association between frequency and opioid.

It is interesting to note that several authors of clinical trials report that smokers who are given acupuncture find the taste for tobacco is altered [29,30]. One report stated that “27% noticed an alteration of the taste of food, 40% noted alteration of smell; 20% developed distaste for alcohol” [19].

Evidence of effectiveness

Rather high success rates have been claimed in uncontrolled studies of acupuncture for smoking cessation. For example, Rogers [31] reported an immediate success rate of 65% in 111 consecutive smokers, and Fuller [32] claimed that 95% of his series of 194 had stopped by the end of the course of treatment. Hackett et al [33] reported that half his series of 20 smokers were still not smoking 12 months after treatment. However, all uncontrolled studies rely on patient reports of cessation, which were not validated biochemically. Controlled trials of acupuncture are explored next.

Blinding and control groups for acupuncture

Many RCTs of acupuncture use some form of sham acupuncture as a control, typically needles inserted in incorrect locations. The term “sham” is preferred to placebo because the intervention may not be totally inactive. Smokers recruited to sham acupuncture trials should ideally be acupuncture naïve so that they do not realize they have been treated at the wrong site. For controls in studies on auricular acupuncture, most authors have used points that were supposed not to have any effect on smoking, such as points that are supposed to represent “shoulder” and “eye” [34,35]. Margolin et al [36] conducted a series of pilot studies that showed that points on the helix of the ear were much less sensitive than those in the more central portions, and concluded that they can be used as a valid control. From a traditional view, any point that is 5 mm or more from the active site is considered inactive.

Further problems arise from a lack of agreement on what are the optimal points for smoking cessation. For example, one study used the “kidney”

point [37] as the control, but this point has been used as the active treatment in other studies. This study's findings (no difference between the groups) are somewhat difficult to interpret. Using the basic approach that any effect of acupuncture is likely to derive from stimulating the vagus nerve, it is important to choose a control point outside the area innervated by the vagus. In one study [34], one control group received a stud inserted into the ankle; in another study, the control site was the knee [38]. These sites, however, may not be credible as controls: it seems likely that at least some smokers are aware that anti-smoking acupuncture is generally given on the ears. One study used the mastoid process as a site for the control, and found no significant unblinding when tested at the end of the study [39].

Lewith [40] has suggested that any form of intervention that involves needle insertion is unsuitable as a control, because needling at any location, including areas that are not recognized as acupuncture points, leads to a release of opioid peptides. He argues that this provides an explanation for the lack of significant difference between acupuncture and sham acupuncture in many of the sham-controlled studies. This hypothesis can be tested by randomizing the control group to receive either a needle sham or a nonneedle sham intervention, both at the same, inactive, site. In the one study in which this was done [41], the lack of significant difference between the groups may be caused by a type II error, because the study was not powered with this as the primary outcome.

Blinding of practitioners of any form of manual therapy is difficult if not impossible. One RCT is a rare example of a truly double-blind study in acupuncture [42]: the therapist was not an acupuncturist, but was taught how to give two treatments specifically for the study, and was not told which of the two treatments was genuine. The design can be criticized on the grounds that the therapist is not expert.

Evidence for different acupuncture techniques

The use of semipermanent needles is likely to be the simplest and most cost-effective form of acupuncture treatment. It was tested by Gillams et al [43] in an RCT with sample size of 81 within a primary care setting. The lung point in the ear was located with an electrical point-detector, and a single stud inserted. The stud was replaced each week for a total of 4 weeks. One control group received treatment to a point at the wrong site, and a second received group therapy with education, information addressing the reasons for smoking, and support. Acupuncture was not superior to either control intervention, but the sample size is too small to draw any definitive negative conclusions.

Sustained acupressure using *Vaccaria* seeds has been tested in two recent RCTs. In the study of Waite and Clough [38], smokers were given 20 minutes' EA to the lung point in both ears, followed by acupressure by means of a *Vaccaria* seed. The control group received a similar intervention,

but to the knees. The success rates at 6 months were 5 of 40 and 0 of 38 in the two groups, respectively. In the second study [44], 46 smokers were recruited in an occupational health setting, and were given a combination of acupuncture approaches, with body EA, ear acupuncture, and prolonged ear acupressure using seeds. The genuine group received treatment at appropriate points; the control group received the same amount of stimulation but at nearby acupuncture points that are appropriate for musculoskeletal disorders. At the end of treatment, 7 of 26 in the acupuncture group were confirmed biochemically to be not smoking, compared with none in the control group of 20. After 5 years, four of those who had stopped were still not smoking.

One RCT tested the National Acupuncture Detoxification Association protocol for smoking cessation [45]. A total of 141 smokers were randomized to three groups: a multicomponent educational program with either genuine acupuncture or sham acupuncture, and genuine acupuncture alone. Twenty acupuncture sessions were scheduled over a 4-week period. The success rate showed that the combination of acupuncture and education (40%) was twice as effective as education and sham acupuncture (20%), and four times the rate of acupuncture alone (10%). These differences were statistically significant, and remained as trends over the 12-month follow-up period.

Traditional Chinese acupuncture to body points is claimed to motivate smokers in preparation for stopping. In a trial by Steiner et al [30], 32 smokers in 16 pairs were selected from 82 volunteers, matched for age, sex, and smoking habits. One of each pair was randomized to traditional Chinese acupuncture twice weekly for 2 weeks. The controls were treated at sham points, without eliciting the sensation of de qi. Instead of setting a quit date, smokers were told to “follow your motivation and appetite to the best of your ability.” Only one person in each group completely quit smoking.

Electrical stimulation was tested alone in one RCT in which the primary outcome was the effect on nicotine withdrawal symptoms, with smoking cessation for secondary outcome [39]. Seventy-six smokers were randomized to receive EA at bilateral lung points as the active treatment, or sham EA from a defunctioned apparatus to the mastoid bone, either through needles or rubber electrode. Each intervention was given for 20 minutes on the day of quitting, and repeated on days 3 and 7. After 2 weeks, 15 of the acupuncture group and 16 of the sham group were not smoking, and there was no significant difference in their withdrawal scores at any time. After 9 months, one of the acupuncture group and two controls were still not smoking.

The French formula was applied in what is easily the largest study of acupuncture for smoking cessation. A total of 996 smokers were enrolled in a randomized trial using a 2 × 2 design in which participants received either real (2 mg nicotine) or placebo gum (1 mg nicotine, unbuffered), and either real or sham acupuncture given at days 0, 7, and 28. The acupuncture used

Table 1

Rates of reported smoking cessation in 2×2 controlled trial of nicotine gum, acupuncture, and placebo forms of each

Time-frame	Real gum, real acupuncture (N = 268)	Placebo gum, real acupuncture (N = 272)	Real gum, sham acupuncture site (N = 213)	Placebo gum, sham acupuncture (N = 243)
1 mo	71 (26)	48 (18)	55 (26)	50 (21)
1 y	30 (11)	17 (6)	21 (10)	25 (10)
4 y	8 (3)	6 (2)	3 (1)	8 (3)

Values are numbers (%). There was a significant difference only in favor of all smokers with real gum compared with all receiving placebo.

was the Chinese formula of facial points that is commonly used in France (discussed previously). The outcome up to 4 years is shown in Table 1 (some unpublished data are included, courtesy of the first author). The authors compared all participants receiving real gum with those receiving placebo gum, and compared those having real acupuncture with those given sham: they found a significant effect of nicotine gum but not acupuncture. No study has directly compared different treatment approaches.

Systematic reviews of randomized controlled trials

The first systematic review of acupuncture for smoking cessation (which also included withdrawal of opiates and alcohol) with formal quality assessment was called a meta-analysis, although the results were not mathematically combined [46]. The reviewers commented on the poor quality of the 15 studies, in particular with inadequate sample sizes and lack of biochemical validation. Three were positive and 12 negative, so they concluded that, “there is no evidence that acupuncture is efficacious in the treatment of addiction.”

A meta-analysis of nine studies [47] found acupuncture superior to all controls (odds ratio [OR] 1.48, 95% confidence interval [CI] 1.13–1.94) at 6 or 12 months, but not superior to sham (OR 1.16, 95% CI 0.90–1.49), leading to the conclusion that “we would not dismiss acupuncture as ineffective...[and] there is sufficient evidence...to justify new and more rigorous randomized controlled trials.”

The Cochrane Review of acupuncture for smoking was last updated in 2002, and includes 20 studies of acupuncture, which included 14 comparisons with sham acupuncture, 7 comparisons with another intervention, and 2 comparisons with waiting-list [48]. Some studies used more than one comparison arm. The review considered three time points: the usual follow-ups at 6 and 12 months, and additionally immediately after treatment. The latter was included because this might be the best time to see any effect that acupuncture may have on nicotine withdrawal symptoms. Only four of these studies verified smoking cessation biochemically; the remaining 16 relied on

the participant's report. Fig. 1 shows that immediately after the intervention there was no statistically significant effect of acupuncture compared with sham. The OR for early outcomes was 1.22 (95% CI 0.99–1.49). This pattern remained static over time: the OR after 6 months was 1.50 (95% CI 0.99–2.27) and after 12 months 1.08 (95% CI 0.77–1.52).

The fact that the CI is extremely close to unity (and of borderline statistical significance) raises the question whether the analysis fails to reveal an effect that actually exists. Fig. 1 shows that only two studies were positive. One of these [49] used the French facial points, inserting needles at the moment of inspiration with an anticlockwise twist (a very traditional approach, but also used in other studies). The control group was treated at sham points. Both were treated on three occasions at weekly intervals. In the sample of 117, the success rates were 74% and 29%, respectively. There is no clear clinical reason that explains this study's positive result, because other studies found no effect from similar protocols [42,50]. The other study in Fig. 1 that obtained a high success rate was reported by He et al [44]. It was the only study in this series that used semipermanent acupressure seeds, and it is noteworthy that another recent study using this technique [38] also found an effect compared with sham (this study is not included in Fig. 1 because the first measurement point was 6 months). In both studies, the outcome was verified. It seems possible that sustained ear acupressure may have an effect that is not seen with intermittent sessions of acupuncture. This is intuitively understandable, because effects of a single 20-minute session of acupuncture might possibly last for several hours but not for more than 1 day. These two studies are small, however, with the total number of smokers who succeeded in quitting being only 12. The role of acupressure deserves further research.

In the previously mentioned meta-analysis, the effect of acupuncture was no different from various other active interventions that were used, including herbs [51], timed-locked cigarette case [52], and group therapy or behavior therapy [43,53,54]. Acupuncture was less successful than nicotine gum in the individual study reported previously [50] but the difference failed to reach statistical significance.

Hypnosis

Background

Hypnotic phenomena, including trancelike states for religious or medical purposes, have been practiced throughout the world since the mid 1700s. Mesmer initially described this practice as a phenomenon that results from the magnetism emanating from the practitioner rather than related to the patient [55]. The use of hypnotic techniques to control the use of tobacco was first documented in 1847. Hypnosis is a technique whereby a therapist suggests that a patient experience changes in sensation, perception, thought, and behavior. Initially there is an induction phase that usually includes instructions for relaxation. This phase directs attention through imagery,

Review: Acupuncture for smoking cessation
 Comparison: 01 Acupuncture vs sham acupuncture
 Outcome: 01 Smoking cessation - Early

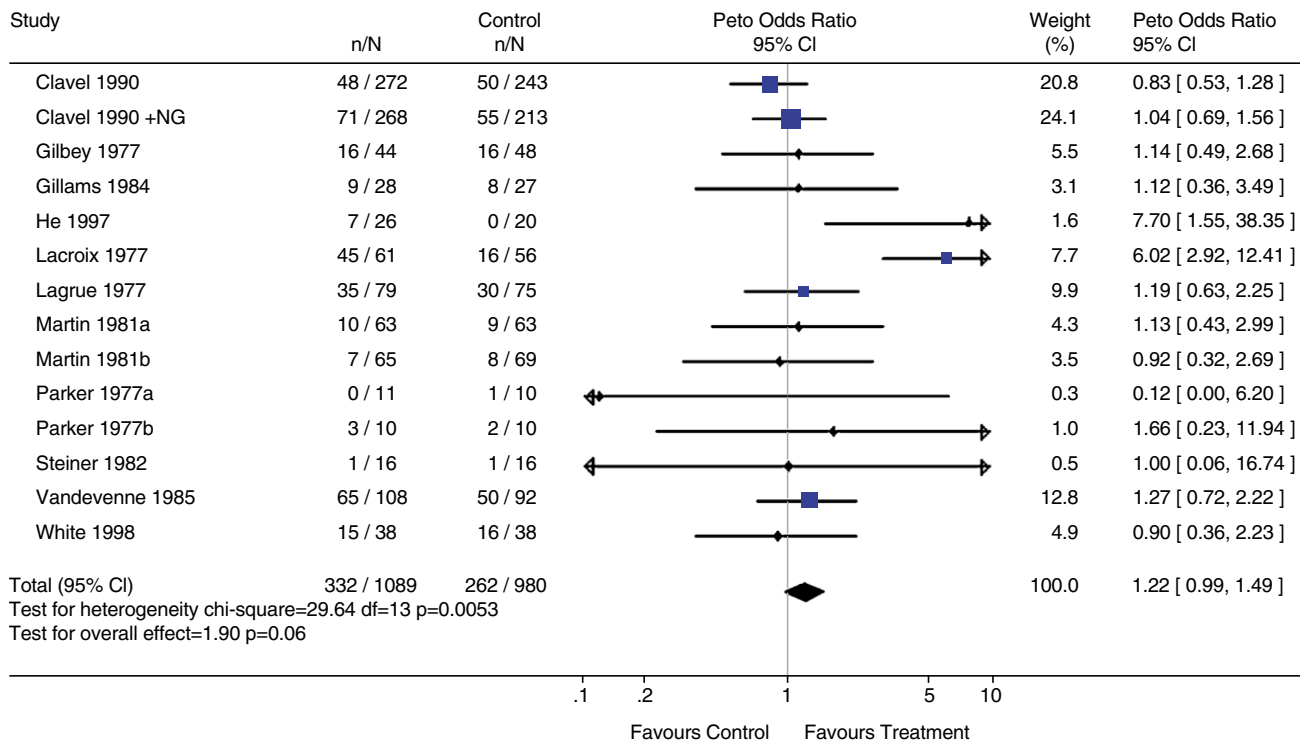


Fig. 1. Summary and meta-analysis of studies of acupuncture versus sham acupuncture for effectiveness in smoking cessation.

distraction, or relaxation. The suggestion phase involves goal-oriented instruction. Last, the postsuggestion phase involves reinforcing the new suggestion after the patient has returned to an awakened, nonhypnotized state of consciousness.

The clinical methods of hypnotherapy vary, so that psychotherapy researchers have failed to delineate criteria for classification. Hypnosis might have been used in at least 1 of 20 ways, including techniques as diverse as direct suggestions, age regression, future progression, visual imagery, hypnotic dreaming, relaxation training, symptom substitution, ego-strengthening, and posthypnotic suggestions [56]. Moreover, it is difficult to measure the specific effects of hypnosis from the behavioral and educational interventions with which it is combined [57].

Possible mechanisms for a hypnosis effect in smoking cessation

The mechanism for how hypnosis works in smoking cessation is not clear. The most common psychologic explanation for how hypnosis works is based on a dissociation model. It is a trance state characterized by extreme suggestibility, relaxation, and heightened imagination. In this state one is also highly suggestible. It is proposed to act on the underlying impulses to weaken the desire to smoke or strengthen the will to stop [58].

Traditional cortical inhibition theories hold that hypersuggestibility is the result of inhibition of the cerebral cortex (and the usual “critical faculties”) caused by some sort of override by lower brain centers. A more recent version of that former pavlovian theory is that the left cerebral hemisphere is somehow selectively inhibited during conditions of hypersuggestibility [59].

Evidence of effectiveness

Clinical reports

Two studies examined consecutively seen patients in a single-group design, both of which lacked a control group. Baer et al [60] studied 172 volunteer subjects. Abstinence rates were 29% at 3 months, 21% at 6 months, and 19% at 12 months. Abstinence rates include dropouts and nonrespondents. Patients who substituted cigars or pipes were considered treatment failures. Dropout rate was 20%. Crasilneck [61] studied 100 patients. Follow-up at 12 months was 81%, although it was unclear whether or not dropout and nonrespondent rates were treated as failures.

Nonrandomized and nonequivalent sample studies

The largest of these studies treated 307 patients in the context of a quasi-experimental design. Clients received various combinations of hypnotic and restricted environmental stimulation therapy [62] that were administered individually and in a group format by both experienced and inexperienced therapists, and in single and multiple sessions. Methods included rapport building and a discussion about the nature of hypnosis, an imagination

exercise, the administration of the Stanford Hypnotic Clinical Scale, suggestions, and self-hypnosis training. Follow-up ranged from 4 to 19 months and used self-report. Abstinence rates ranged from a low of 4% after 4 months for individual hypnosis conducted by inexperienced interns, to 47% after 19 months for patients treated with a combination of individual hypnosis by an experienced hypnotist and restricted environmental stimulation therapy. After 13 months, a no-treatment control group achieved a 6% abstinence rate [63].

Experimental investigations: less than recommended sample size. The latest was a series of three studies by Spanos et al [65,66]. He studied variants of Spiegel's [64] smoking cessation method by varying the wording of the procedure (passive versus active). Unfortunately, results in all three groups showed no treatment effect. Abstinence in study 1 was 6% at 6 months; in study 2, 2% at 3 months; and study 3, 4% at 4 months. Biochemical measures confirmed self-reports [65].

In a fourth study, Spanos et al [66] studied 54 individuals who volunteered to participate in a free smoking cessation program. Participants were randomly assigned to a two-session multicomponent (ie, Spiegel's [64] message) combined with components taken from Hall and Crasilneck [67]. Treatment began with an hypnotic induction or no induction, a two-session placebo treatment, or a wait list control. None of the participants in any of the groups was abstinent at the final 3-month follow-up.

Rigorous experimental studies. Rabkin et al [68] randomly assigned 168 subjects to an individual 30-minute hypnosis session, group behavioral treatment, group health education, or to a waiting-list control. Hypnosis featured Spiegel's [64] method. The groups were made up of 8 to 10 subjects and met five times over a 3-week period. Serum thiocyanate levels were drawn initially and at week 3. Self-report data at 6 months revealed that 23% of those hypnotized, 30% of those in the behavior modification group, and 24% of the health education group were abstinent. Abstinence rate of the control group was 0%.

Valbo and Eide [69] in Norway randomly assigned 158 pregnant smoking women to either a hypnosis treatment consisting of two sessions, 2 weeks apart, or to a control condition in which only standard prenatal care was given. Part of the hypnosis session was tape recorded. Results showed only 8% of the women in the hypnosis group achieved abstinence, and 10% of the women in the control group achieved abstinence at 18-month follow-up.

Systematic reviews of randomized controlled trials. The Cochrane Review of hypnosis was last updated 2003, and includes nine studies, which compared hypnotherapy with 14 different control interventions [70]. All studies had 6-month follow-up. There was significant heterogeneity between the results of the individual studies, with conflicting results for the effectiveness of

hypnotherapy compared with no treatment or advice. ORs were not calculated. There was no evidence of an effect of hypnotherapy compared with rapid smoking or psychologic treatment.

Evaluation difficulties

The specific efficacy of hypnosis in clinical reports is difficult to evaluate for a number of reasons. The therapist does not always report the use of standardized scripts, or they tailor the interventions to the individual [61]; provide participants with variable numbers of sessions within a particular study, often based on perceived need; incorporate self-hypnosis practice outside of the session [71]; include adjunctive interventions, such as telephone contact, nicotine gum, rapid smoking, systematic desensitization, and other behavioral interventions [61]; and use a wide variety of hypnotic procedures within and across studies [72].

The absence of a suitable placebo for hypnotherapy to control for the nonspecific effects also makes evaluation difficult. To date, most scientific studies have been either case reports or poor-quality uncontrolled trials, which show a great variability in quit rates (4%–88%) at 6-month follow-up.

At this time, hypnosis cannot be regarded as a specific and efficacious treatment for smoking cessation. It is possible that future research will more firmly establish hypnosis as an empirically supported treatment for smoking cessation.

Summary

For both hypnotherapy and acupuncture, the evidence of any effect is anecdotal. There are insufficient rigorous studies that are homogeneous in design or results to allow a reliable conclusion on whether or not these therapies are effective. At best, individual smokers who choose one of these interventions for preference should not be discouraged provided that they are informed about the state of the evidence.

References

- [1] Hu J. Questions and answers. *J Tradit Chin Med* 1991;11:146–8.
- [2] Paterson C, Britten N. Acupuncture for people with chronic illness: combining qualitative and quantitative outcome assessment. *J Altern Complement Med* 2003;9:671–81.
- [3] Nogier PMF. *Handbook to auriculotherapy*. Moulin-les-Metz (France) Maisonneuve; 1981.
- [4] Ceccherelli F, Gagliardi G, Seda R, Corradin M, Giron G. Different analgesic effects of manual and electrical acupuncture stimulation of real and sham auricular points: a blind controlled study with rats. *Acupunct Electrother Res* 1999;24:169–79.
- [5] Margolin A, Avants SK, Chang P, Birch S, Kosten TR. A single-blind investigation of four auricular needle puncture configurations. *Am J Chin Med* 1995;23:105–14.
- [6] Oleson TD, Kroenig RJ, Bresler DE. An experimental evaluation of auricular diagnosis: the somatotopic mapping of musculoskeletal pain at ear acupuncture points. *Pain* 1980;8: 217–29.

- [7] Wen HL, Cheung SYC. Treatment of drug addiction by acupuncture and electrical stimulation. *Asian Journal of Medicine* 1973;9:138–41.
- [8] Wen HL, Teo SW. Experience in the treatment of drug addiction by electro-acupuncture. *Mod Med Asia* 1975;11:23–4.
- [9] Sainsbury MJ. Acupuncture in heroin withdrawal. *Med J Aust* 1974;2:102–5.
- [10] Severson L, Markoff RA, Chun-Hoon A. Heroin detoxification with acupuncture and electrical stimulation. *Int J Addict* 1977;12:911–22.
- [11] Newmeyer JA, Johnson G, Klot S. Acupuncture as a detoxification modality. *J Psychoactive Drugs* 1984;16:241–61.
- [12] Smith MO, Squires R, Aponte J, Rabinowitz N, Bonilla-Rodriguez R. Acupuncture treatment of drug addiction and alcohol abuse. *American Journal of Acupuncture* 1982;10:161–3.
- [13] Smith MO. An acupuncture programme for the treatment of drug-addicted persons. *Bull Narc* 1988;40:35–41.
- [14] Jeffreys DB, Smith S, Brennard-Roper DA, Curry PVL. Acupuncture needles as a cause of bacterial endocarditis. *BMJ* 1983;287:326–7.
- [15] Lee RJE, McIlwain JC. Subacute bacterial endocarditis following ear acupuncture. *Int J Cardiol* 1985;7:62–3.
- [16] Sachs LL. Drug addiction, alcoholism, smoking, obesity treated by auricular acupuncture. *American Journal of Acupuncture* 1975;3:147–50.
- [17] The Academy of Traditional Chinese Medicine. An outline of Chinese acupuncture. Peking: Foreign Languages Press; 1975.
- [18] Man SC. A preliminary clinical study of smoking treated by stitch-auriculo-acupuncture. Presented at the Third World Symposium on Acupuncture and Chinese Medicine. New York, March 1975.
- [19] Poupy JL. Traitement antitabagique par acupuncture. *Gazette Médicale de France* 1977;84:2897–900.
- [20] Hughes J, Smith TW, Kosterlitz HW, Fothergill LA, Morgan BA, Morris HR. Identification of two related pentapeptides from the brain with potent opiate agonist activity. *Nature* 1975;258:577–80.
- [21] Han JS, Chou PH, Lu CC, Yang T, Jen MF. The role of central 5-HT in acupuncture analgesia. *Scientia Sinica* 1979;22:91–104.
- [22] Pomeranz B, Chiu D. Naloxone blockade of acupuncture analgesia: endorphin implicated. *Life Sci* 1976;19:1757–62.
- [23] 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.
- [24] Clement-Jones V, McLoughlin L, Tomlin S, Besser GM, Rees LH, Wen HL. Increased beta-endorphin but not met-enkephalin levels in human cerebrospinal fluid after acupuncture for recurrent pain. *Lancet* 1980;316:945–7.
- [25] Boureau F, Willer JC. Désintoxication tabagique par l'acupuncture: essai négatif de blocage par la naloxone. *Nouv Presse Med* 1975;7:1401.
- [26] Ng LKY, Douthitt TC, Thoa NB, Albert CA. Modification of morphine-withdrawal syndrome in rats following transauricular electrostimulation: an experimental paradigm for auricular electroacupuncture. *Biol Psychiatry* 2003;10:575–80.
- [27] Choy YM, Tso W-W, Fung KP, Leung MC, Tsang YF, Lee CY, et al. Suppression of narcotic withdrawals and plasma ACTH by auricular electroacupuncture. *Biochem Biophys Res Commun* 1978;82:305–9.
- [28] Han JS, Zhang RL. Suppression of morphine abstinence syndrome by body electroacupuncture of different frequencies in rats. *Drug Alcohol Depend* 1993;31:169–75.
- [29] Labadie JC, Dones JP, Gachie JP, Fréour P, Perchoc S, Huynh-Van-Thao JP. Désintoxication tabagique: acupuncture et traitement médical. Résultats comparés à 1 an sure 130 cas. *Gaz Med Fr* 1983;90:2741–7.

- [30] Steiner RP, Hay DL, Davis AW. Acupuncture therapy for the treatment of tobacco smoking addiction. *Am J Chin Med* 1982;10:107–21.
- [31] Rogers PAM. Ear acupuncture to help control smoking. *Acupuncture Research Quarterly* 1977;6:75–6.
- [32] Fuller JA. Smoking withdrawal and acupuncture. *Med J Aust* 1982;1:28–9.
- [33] Hackett GI, Burke P, Harris I. An anti-smoking clinic in general practice. *Practitioner* 1984; 228:1079–82.
- [34] Martin GP, Waite PME. The efficacy of acupuncture as an aid to stopping smoking. *N Z Med J* 1981;93:421–3.
- [35] Parker LN, Mok MS. The use of acupuncture for smoking withdrawal. *American Journal of Acupuncture* 1977;5:363–6.
- [36] Margolin A, Avants K, Kleber H. Investigating alternative medicine therapies in randomized controlled trials. *JAMA* 1998;280:1626–7.
- [37] Gilbey V. Auricular acupuncture for smoking withdrawal. *American Journal of Acupuncture* 1977;5:239–47.
- [38] Waite NR, Clough JB. A single-blind, placebo-controlled trial of a simple acupuncture treatment in the cessation of smoking. *Br J Gen Pract* 1998;48:1487–90.
- [39] White AR, Resch KL, Ernst E. Randomized trial of acupuncture for nicotine withdrawal symptoms. *Arch Intern Med* 1998;158:2251–5.
- [40] Lewith G. The treatment of tobacco addiction. *Complement Ther Med* 1995;3:142–5.
- [41] White AR, Resch KL, Ernst E. Smoking cessation with acupuncture? A 'best evidence synthesis'. *Forschende Komplementarmedizin* 1997;4:102–5.
- [42] Lagrue G, Poupy JL, Grillot A, Ansquer JC. Acupuncture anti-tabagique. *La Nouvelle Presse Médicale* 1977;9:966.
- [43] Gillams J, Lewith GT, Machin D. Acupuncture and group therapy in stopping smoking. *Practitioner* 1984;228:341–4.
- [44] He D, Medbo JI, Hostmark AT. Effect of acupuncture on smoking cessation or reduction: an 8-month and 5-year follow-up study. *Prev Med* 2001;33:364–72.
- [45] Bier ID, Wilson J, Studt P, Shakleton M. Auricular acupuncture, education, and smoking cessation: a randomized, sham-controlled trial. *Am J Public Health* 2002;92:1642–7.
- [46] Ter Riet G, Kleijnen J, Knipschild P. A meta-analysis of studies into the effect of acupuncture on addiction. *Br J Gen Pract* 1990;40:379–82.
- [47] Ashenden R, Silagy CA, Lodge M, Fowler G. A meta-analysis of the effectiveness of acupuncture in smoking cessation. *Drug Alcohol Rev* 1997;16:33–40.
- [48] White AR, Rampes H, Ernst E. Acupuncture for smoking cessation (Cochrane Review). *Cochrane Database Syst Rev* 2002;2:CD000009.
- [49] Lacroix J-C, Besançon F. Le sevrage du tabac: efficacité de l'acupuncture dans un essai comparatif. *Ann Med Interne (Paris)* 1977;128:405–8.
- [50] Clavel-Chapelon 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. *Rev Epidemiol Sante Publique* 1990;38:133–8.
- [51] Circo A, Tosto A, Raciti S, Cardillo R, Gulizia M, Oliveri M, et al. Primi risultati di un ambulatorio anti-fumo. *Cardiologia Preventiva e Riabilitativa* 1985;3:147–51.
- [52] Clavel-Chapelon 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 a control group. *BMJ* 1985;291:1538–9.
- [53] Cottraux JA, Harf R, Boissel J-P, Schbath J, Bouvard M, Gillet J. Smoking cessation with behaviour therapy or acupuncture: a controlled study. *Behav Res Ther* 1983;21:417–24.
- [54] Leung JP. Smoking cessation by auricular acupuncture and behavioral therapy. *Psychologia* 1991;34:177–87.
- [55] Wickramasekera I. Hypnotherapy. In: Jonas W, Levin J, editors. *Essentials of complementary and alternative medicine*. Philadelphia: Lippincott Williams & Wilkins; 1999. p. 505.
- [56] Katz NW. Hypnosis and the addictions: a critical review. *Addict Behav* 1980;5:41–7.

- [57] Green JP, Lynn SJ. Hypnosis and suggestion-based approaches to smoking cessation: an examination of the evidence. *Int J Clin Exp Hypn* 2000;48:195–223.
- [58] Spiegel D, Frischolz EJ, Fleiss JL, Spiegel H. Predictors of smoking abstinence following a single-session restructuring intervention with self-hypnosis. *Am J Psychiatry* 1993;150:1090–7.
- [59] Holroyd J, Crasilneck HB. Development of a hypnotic technique for treating chronic cigarette smoking. *Int J Clin Exp Hypn* 1970;18:341–57.
- [60] Baer L, Carey RJ, Meminger SR. Hypnosis for smoking cessation: a clinical follow-up. *Int J Psychosom* 1986;33:13–6.
- [61] Crasilneck HB. Hypnotic techniques for smoking control and psychogenic impotence. *Am J Clin Hypn* 1990;32:147–53.
- [62] Best J, Suedfeld P. Restricted environmental stimulation therapy and behavioral self-management in smoking cessation. *J Appl Soc Psychol* 1982;12:408–19.
- [63] Morgan AH, Hilgard JR. Stanford Hypnotic Clinical Scale (SHCH). In: Hilgard ER, Hilgard JR, editors. *Hypnosis in the relief of pain*. Los Altos: William Kaufmann; 1975. p. 209–21.
- [64] Spiegel H. A single treatment method to stop smoking using ancillary self-hypnosis. *Int J Clin Exp Hypn* 1970;18:235–50.
- [65] Spanos NP, Sims A, DeFaye B, Mondoux TJ, Gabora NJ. Comparison of hypnotic and nonhypnotic treatments for smoking. *Imagination, Cognition, and Personality* 1992;12:23–45.
- [66] Spanos NP, Mondoux TJ, Burgess CA. Comparison of a multicomponent hypnotic and nonhypnotic treatments for smoking. *Contemporary Hypnosis* 1995;12:12–9.
- [67] Hall JA, Crasilneck HB. Development of a hypnotic technique for treating chronic cigarette smoking. *Int J Clin Exp Hypn* 1970;18:283–9.
- [68] Rabkin SW, Boyko E, Shane F, Kaufert J. A randomized trial comparing smoking cessation programs utilizing behavior modification, health education, or hypnosis. *Addict Behav* 1984;9:157–73.
- [69] Valbo A, Eide T. Smoking cessation in pregnancy: the effect of hypnosis in a randomized study. *Addict Behav* 1996;21:29–35.
- [70] Abbot NC, Stead LF, White AR, Barnes J. Hypnotherapy for smoking cessation (Cochrane Review). In: *The Cochrane Library, Issue 3*. Oxford: Update Software; 2003.
- [71] Johnson DL, Karkut RT. Performance by gender in a stop-smoking program combining hypnosis and aversion. *Psychol Rep* 1994;75:851–7.
- [72] Marriot JA, Brice GL. A single session of hypnosis to stop smoking: a clinical survey. *Australian Journal of Clinical Hypnotherapy and Hypnosis* 1990;11:21–8.