

# Acupuncture for smokers: lack of long-term therapeutic effect in a controlled study

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Two types of acupuncture therapy, one aimed specifically at smoking withdrawal and the other aimed at enhancing relaxation, were compared with self-monitoring in 75 healthy men that wished to stop smoking. During the 2 weeks following treatment there was no significant difference in the adjusted mean daily smoking rates of the subjects receiving acupuncture therapy of the two types, but their combined rate was significantly lower than the rate of the subjects in the self-monitoring group. However, at 1, 3 and 6 months following treatment there were no longer statistically significant differences between the three treatment groups in the adjusted mean smoking rates. At no time were there significant differences between the three treatment groups in the proportion of subjects that stopped smoking during the study. Although acupuncture appears to have become a popular treatment for cigarette smokers, its effectiveness remains to be proven in the treatment of tobacco addiction.

Deux types d'acupuncture, l'un visant au traitement du tabagisme, l'autre à la relaxation, ont été comparés à une méthode d'auto-contrôle chez 75 fumeurs désirant cesser leur habitude. Au cours des 2 semaines qui ont suivi le traitement il n'existait aucune différence significative entre la consommation moyenne quotidienne de cigarettes des deux groupes qui ont reçu de l'acupuncture, mais la consommation combinée de ces deux groupes était significativement plus basse que la consommation des sujets dans le groupe d'auto-contrôle. Cependant, à 1, 3 et 6 mois après le traitement il n'existait aucune différence significative entre les trois groupes dans la consommation moyenne quotidienne de cigarettes. De plus, on n'a trouvé aucune différence significative entre les trois groupes dans la proportion de sujets qui ont cessé de fumer au cours de l'étude. Même si l'acupuncture semble devenir un traitement populaire pour les fumeurs, son efficacité demeure encore à prouver dans le traitement du tabagisme.

Although acupuncture appears to have become a popular treatment for cigarette smokers, few studies on its efficacy are to be found in the literature. From uncontrolled studies of acupuncture therapy Poupy<sup>1</sup> in France reported that 77% of 350 smokers stopped smoking within a 5-week study and Sacks<sup>2</sup> in California reported that 61% of 642 smokers stopped smoking for not less than 6 months. However, Parker and Mok<sup>3</sup> obtained less favourable results. They studied auricular acupuncture in 41 volunteer hospital employees randomly divided into four groups; two groups received electrical or press needle stimulation at the Shen-Men and lung points, and two other groups, acting as con-

trols, were stimulated identically, but at the shoulder and eye points. Of all the subjects 15% stopped smoking, and of those receiving the slightly more successful press needle stimulation 28% stopped smoking during the 6-week study.

We compared two types of acupuncture therapy, one aimed specifically at smoking withdrawal and the other aimed at enhancing relaxation, with self-monitoring. The participants were followed up for 6 months after the treatment had been completed.

## Method

### Subjects

The volunteers were recruited by an advertisement in a Montreal daily newspaper stating that 75 men that wished to stop smoking were needed for an experiment to evaluate the efficacy of acupuncture and self-monitoring in the treatment of smokers. The subjects were required to be between 20 and 50 years old, to have smoked between 15 and 50 cigarettes per day for at least 3 years, not to be taking drugs regularly and to be in good physical health. The applicants were told that only highly motivated subjects would be chosen, that they would have to call for an appointment, to come to our unit twice to fill out questionnaires, and to attend five 1-hour treatment and follow-up sessions. Of the 214 subjects who came for preliminary evaluation 75 healthy men satisfying the selection criteria were chosen for treatment on the basis of their responses to a questionnaire regarding their concern over possible health hazards and the seriousness of their smoking problem. They all signed the same general consent form, which stated that they agreed to participate in a trial in which they might receive one or the other type of treatment and for which they were neither to pay nor be paid for their participation. Their mean age was 32.8 years (minimum 21, maximum 50), they smoked a mean of 29.1 cigarettes per day (minimum 15, maximum 50) and the mean number of years they had smoked regularly was 16.9 (minimum 3, maximum 35).

### Study design and control measures

Twenty-five subjects were randomly assigned to each of the three experimental conditions. After randomization there were no significant ( $P < 0.05$ ) differences between the three treatment groups in mean age, daily smoking rate or duration of smoking habit (Table I). An experienced acupuncturist, referred to us by the Professional Corporation of Physicians of Quebec, was hired to carry out the therapy, which was to be as similar as possible for all subjects. The general direct-

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ives were the same for all subjects: they were advised to stop smoking and received written information on the hazards of tobacco.

### Measures of target variable

The target variable was the number of cigarettes smoked per day by each subject. Subjective estimates of prior smoking were noted, then, with the aid of a counter,<sup>4,6</sup> the subjects recorded each cigarette smoked during a 14-day period and entered the daily total on a calendar sheet to obtain a precise estimate of the smoking rate before treatment. Using the counter they followed the same procedure to estimate the smoking rate during 14-day periods immediately following treatment and 1, 3 and 6 months thereafter.

### Treatment groups

**Acupuncture therapy for smoking withdrawal:** Subjects in this group received two weekly 20-minute sessions.<sup>1</sup> Needles were placed at the ear 0 and lung points, which are thought to be effective for smoking withdrawal.<sup>7</sup> As in other studies no electrical stimulation was done,<sup>1,3,8</sup> and no ear staples were used<sup>1,3</sup> because of the possibility of infection.<sup>9</sup>

**Acupuncture therapy for relaxation:** Subjects in this group received the same type of treatment except that the needles were placed at the following points:<sup>7</sup> heart 4, three heaters 10, conception vessel 7, conception vessel 17, bladder 60, stomach 36, stomach 45, small intestine 3, kidney 3 and ear 24. As there are no grounds to suppose that these points are effective for smoking withdrawal this group was considered as a control group for the evaluation of acupuncture therapy for smoking withdrawal.

**Self-monitoring:** Subjects in this group were asked to try to stop smoking by their own means with the help of the counter.<sup>10</sup> They also met the therapist for two weekly 20-minute sessions but only to report on the means they had used to try to reduce smoking and to return their calendar sheets. This group also served as a control group since self-observation and participation in the study may influence smoking behaviour.<sup>5</sup> Thus we were able to evaluate whether either type of acupuncture was more efficient than self-monitoring alone.

## Results

### Dropouts

One subject receiving acupuncture for smoking withdrawal left the study before completing the treatment; therefore the data for this person were excluded from all statistical analysis. One subject that received acupuncture for relaxation and stopped smoking following the treatment had not resumed smoking by the time of the 1-month follow-up evaluation but failed to return for the 3- and 6-month follow-up evaluations. One subject in the self-monitoring group, for whom there was little change in smoking habit, did not return for the 6-month follow-up evaluation.

### Subjects that stopped smoking

Table II shows the number and proportion of sub-

jects in each treatment group that reported not smoking during the 14-day periods after treatment and at each follow-up point. The two dropouts who completed treatment were considered to have resumed smoking by the time of the evaluation for which their data were missing. The proportions of subjects in each group that reported not smoking during an evaluation period were compared by separate chi-square tests for 2 × 3 contingency tables. At no time were there any significant differences at the 10% level between the three treatment groups in these proportions. In addition, since the most extreme difference between two groups in the proportions of subjects that stopped smoking (that immediately following treatment between the group receiving the acupuncture for relaxation and that doing self-monitoring) was not significant ( $\chi^2_1 = 1.59, P > 0.10$ ), none of the differences obtained in other pairwise comparisons of the results of treatment could have been significant. Apart from five exceptions (Table II) the subjects who reported not smoking during the follow-up evaluations had stopped smoking immediately following treatment.

### Mean daily smoking rates

Fig. 1 shows the mean number of cigarettes smoked per day during each evaluation period in the three treatment groups, with the nonsmokers included. Analysis of variance revealed no significant difference

Table I—Age, estimated smoking rate and duration of smoking habit of subjects assigned to each treatment group

Treatment	Mean ± standard deviation		
	Age (yr)	No. of cigarettes smoked per day	Duration of smoking habit (yr)
Acupuncture for smoking withdrawal	33.2 ± 7.9	30.4 ± 6.0	16.4 ± 8.0
Acupuncture for relaxation	35.1 ± 6.8	27.8 ± 5.8	19.4 ± 7.6
Self-monitoring	30.4 ± 7.3	29.4 ± 8.2	15.2 ± 7.4
F value*	2.62	0.96	1.97
Probability	0.10 > P > 0.05	P > 0.10	P > 0.10

\*From analysis of variance (degrees of freedom: 2 and 71).

Table II—Proportions of subjects not smoking during 14-day periods after treatment and at three follow-up points

Treatment	No. (and %) of subjects			
	After treatment	Follow-up		
		1 month	3 months	6 months
Acupuncture for smoking withdrawal	7 (29)	6 (25)	5* (21)	2 (8)
Acupuncture for relaxation	9 (36)	7 (28)	5* (20)	4* (16)
Self-monitoring	5 (20)	6† (24)	5 (20)	5 (20)
$\chi^2$ with two degrees of freedom	1.59	0.11	0.01	1.36
Probability	P > 0.10	P > 0.10	P > 0.10	P > 0.10

\*Includes one new nonsmoker.

†Includes two new nonsmokers.

( $F_{2,71} = 1.91, P > 0.10$ ) between the treatment groups in the mean smoking rates in the 14-day period before treatment began. The mean rates in the 14-day evaluation periods following treatment were analysed separately for each period by analyses of covariance, with the pretreatment smoking rates used as the covariates. There were no instances of significant heterogeneity of covariance regression at the 5% level, so each analysis of covariance was based on a common regression slope for the three treatment groups. In each analysis, in addition to determining a global F statistic assessing the significance of differences between the three treatment groups, we carried out the following set of orthogonal comparisons determined a priori: the adjusted mean smoking rate of subjects receiving acupuncture for smoking withdrawal was compared with that of the subjects receiving acupuncture for relaxation; and the combined adjusted mean smoking rate of the two acupuncture groups was compared with the adjusted mean smoking rate of the self-monitoring group. Data for the two dropouts that completed the treatment were excluded from the analyses for the evaluation periods from which they were absent.

Analysis of covariance revealed that in the 14 days immediately following treatment there was a significant difference ( $F_{2,70} = 3.85, P < 0.05$ ) between the adjusted mean smoking rates of the three treatment groups. The orthogonal comparisons for this analysis showed no significant difference ( $F_{1,70} = 0.0009, P > 0.10$ ) between the adjusted mean smoking rates of the two acupuncture groups (10.8 v. 10.7/d), but the combined adjusted mean smoking rate of these two groups was significantly lower ( $F_{1,70} = 7.82, P < 0.01$ ) than the adjusted mean smoking rate of the self-monitoring group (18.8/d). However, at 1 month ( $F_{2,70} = 1.10, P > 0.10$ ), 3 months ( $F_{2,69} = 0.42, P > 0.10$ ) and 6 months ( $F_{2,68} = 0.22, P > 0.10$ ) following treatment there were no longer significant differences between the adjusted mean smoking rates of the three treatment groups. (Nor did the orthogonal comparisons show significant differences at the 10% level during follow-up.) The smallest observed difference between

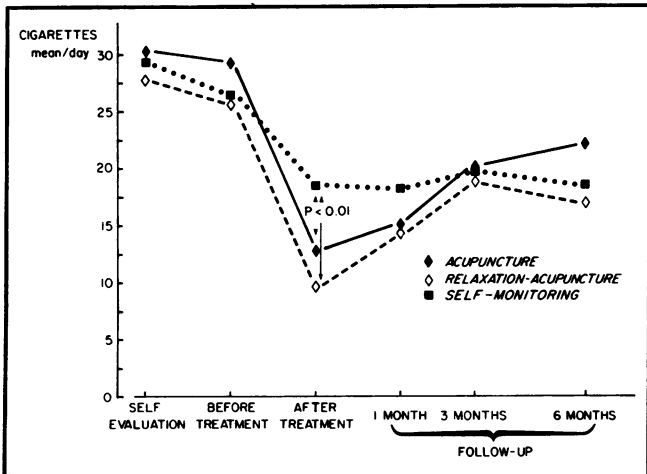


FIG. 1—Mean smoking rates for 14-day periods during study (P value refers to statistical significance of difference between adjusted mean smoking rates from analysis of covariance).

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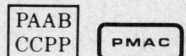


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the mean smoking rates of the two acupuncture groups and the self-monitoring group that could have been detected as significant ( $P < 0.05$ ) during follow-up was 6.0 cigarettes per day. Similarly, our experimental design would have enabled an observed difference between the smoking rates of the two acupuncture groups of 6.9 cigarettes per day to be detected as significant ( $P < 0.05$ ).

### Discussion

The results of this study demonstrated that neither type of acupuncture had a lasting effect on the smoking behaviour of this group of male cigarette smokers beyond that of self-monitoring alone. Immediately following treatment the mean smoking rate of the two acupuncture groups declined by 16 cigarettes per day (58%), which was significantly better than the decline of 8 cigarettes per day (30%) in the self-monitoring group despite no significant difference between the three groups in the proportion of subjects that stopped smoking. But, whereas the improvement in the self-monitoring group was maintained during the 6-month follow-up period, 1 month after treatment the mean smoking rate of the subjects receiving either type of acupuncture was no longer significantly different from that of the self-monitoring group. Furthermore, there was no significant difference at any time between the effect of acupuncture aimed specifically at smoking withdrawal and that of acupuncture aimed at enhancing relaxation, which served as a placebo control. Similarly, Parker and Mok,<sup>3</sup> in a trial in which electrical or press needle stimulation at the supposedly effective Shen-Men and lung points was compared with that at the ineffective shoulder and eye points (which served as a placebo control), found minimal differences in the smoking behaviour of the two groups after treatment despite a longer treatment period (two sessions a week for 3 weeks) than in our study. However, their study included only 10 subjects per group.

The decline in the mean smoking rate of the self-monitoring control group was largely due to the 20% of subjects who stopped smoking for the duration of the study. Presumably this was a result of motivation and the use of the counter to monitor the smoking rate. In a previous study with cigarette smokers we suggested that self-monitoring with a counter may be considered a therapeutic tool in itself,<sup>11</sup> and the results of the present study tend to support this. The low dropout rate (4%) during the 6-month follow-up period confirms that the participants, who had been chosen on the basis of their degree of concern about

their smoking habit, were indeed a highly motivated group.

In conclusion, our results show that after 1 month acupuncture therapy was no longer more effective than self-monitoring alone in reducing the rate of cigarette smoking and that acupuncture aimed specifically at smoking withdrawal was at no time superior to acupuncture aimed at enhancing relaxation. As Parker and Mok<sup>3</sup> have pointed out, there is at present no agreement as to which acupuncture points are most effective in influencing smoking. The length of the treatment period as well as the effect of booster sessions also need to be documented. Whitehead<sup>12</sup> maintains that "much of what has been said or written about the use of acupuncture in the management of addictions is found to fall seriously short of adequate clinical trials". Other objective studies of the scope and limitations of acupuncture in Western medicine remain to be carried out.

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### Tobacco: a "counter-blaste"

*Surely Smoke becomes a kitchen far better than a Dining chamber, and yet it makes a kitchen also oftentimes in the inward parts of men, soiling and infecting them, with an unctuous and oily kind of Soote, as hath bene found in some great Tobacco takers, that after death were opened.*

—James I of England, from "A Counter-Blaste to Tobacco", printed in "Familiar Medical Quotations", Maurice B. Strauss (ed), Little, Brown & Co., Boston, Mass., 1968, p 620