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Chapter 14

Acupuncture for Addictions

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Additional information is available at the end of the chapter

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1. Introduction

1.1. Heroin addiction

For centuries opiate addiction has been a difficult health and social problem. The morbidity and mortality related to such addiction affect not only the individual but also bring disastrous effects to the affected families and their communities [1, 2]. Based on Quoting epidemiological data in social surveys done in the last decade, over 13 million opium addicts are living in different countries, while Asia has the largest number. Heroin addiction gives the most severe affections and the number might be exceeding 9 millions [3, 4]. In the city of Hong Kong alone, about 16,000 heroin addicts have registered with the Central Registry of Drug Abuse [5].

Before we consider various means that can be used to counteract opium addiction, we need to know how the addiction affects the individuals.

1.2. Health hazards related to opiate addiction

Opiate and its derivatives depress the central nervous system activities which can last up to six hours after opiates have been consumed. Moreover, there is a subjective effect, which persists for another 5-6 hours. Once the opiate tolerance developed, the opiate consumer tends to require higher and higher doses to avoid the withdrawal symptoms. Apart from the central nervous system, there are severe gastro-intestinal upsetsand disturbances to other physiological systems [6].

Opiate or heroin is commonly taken together with alcohol, barbiturates and/or other abusive drugs, resulting in life-threatening morbidities such as respiratory distress, serious infections etc. The application of injections introduces viral infections like hepatitis and AIDS [7].

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The intolerability and the degree of withdrawal symptoms are so severe that addicts tend to experience a change of personality and their daily activities are focused on the acquisition of the drug. The direct outcome is the rapid development of anti-social behaviour. The abrupt or gradually loss of harmony in the families of the addicts merge into difficult anti-social problems, often involving crimes. The general health deteriorations and anti-social tendencies make this group of people particularly prone to addiction related infections like HIV. Statistics have already indicated that about 80% HIV infections are related to heroin injections [7].

1.3. Treatment available for withdrawal symptoms

Opiate physical dependence can berapidly developed after only 2 to 10 days of continuous consumption of opiates, particularly with heroin. When the drug is stopped, a complex system of symptoms consisting of diffuse pain autonomic disturbances i.e. diarrhea, rhinorrhea, nausea and vomiting, and central nervous system irritations may be presented in these addicts with rapidly increased intensities.

The treatment for Heroin Addiction include detoxification, substitutional therapy and symptom control. Detoxification includes weaning off the opiate with the use of adrenergic antagonistic drugs (like clonidine), pain-killers, and sedatives to minimize the withdraw symptoms, improve sleep and anxiety. Detoxification medication may help during the urgent need for relief of the withdrawal syndrome, but the overall effectiveness has not been satisfactory [8].

The disappointment with detoxification therapy has led to the introduction and later adoption of substitutional therapy. SinceHeroin is producing such severe withdrawal syndrome which are difficult to control, one way to manage the heroin addiction is to replace with a less addicting, more tolerable opiate, as a step towards the ultimate removal. Methadone has been accepted world-wide as a suitable opiate that satisfies the need of substitution because it has an oral preparation with stable effects and long half-life of 18 to 24 hours. Withdrawal symptoms arising from Methadone are not as severe as compared to heroin and other opiates. Methadone has therefore been popularly used as a substitute, when problems in personality, family and/or community are hindering the proper arrangements for a total withdrawal. In the latter situation, a special term "Methadone Maintenance Treatment" (MMT) has been created. In some cases a single dose of around 80 mgm MMT,would be sufficient for a day [9].

One disadventage of Methadone and MMT is that adverse effects are still prominent which include nausea, vomiting, dizziness, gastro-intestinal symptoms, respiratory symptoms and even haematological disturbances. Long term methadone users have tendency to develop depression [10].

Opiate addiction is such a long medical and social problem. Although therapeutic means are available, none of them is considered satisfactory. Further exploration on other alternative ways is needed for therapeutic control. The heavy influence of personality and socio-psychological interactions contributing towards the occurrence of addiction naturally call for special psychological therapy, which has been adopted as standard therapeutic measures for addicts in well-established centers. Other alternative treatment includes the application of traditional Chinese medicine [11].

1.4. Acupuncture as treatment for withdrawal symptoms

Acupuncture is well-known for the control of pain and some autonomic symptoms like nausea, vomiting and dizziness. In China, the application of acupuncture for opiate withdrawal is therefore a logical historical attempt. Now acupuncture as a treatment option for difficult pain related conditions, is increasing its popularity over the world. In 1998, the National Institutes of Health of the US, held a Consensus Conference which endorsed Acupuncture as the therapeutic measure to be recommended for pain, as well as nausea and vomiting control [12].

Looking through the available literature from 1976 to 2006, more than 70 clinical trials on the use of acupuncture for heroin addiction have been published in the Chinese and English language journals, involving more than 5,000 cases [13]. Summarizing the reports about the results of treatment, the suggestions include the following:

i. Acupuncture gives rapid and efficient effects against the withdrawal symptoms when used as detoxification agent [14].

ii. Acupuncture works well together with Methadone in the MMT scheme [15].

iii. The newer form of auricular acupuncture shows good responses [16].

iv. Herbal medicine can be used together with acupuncture for additional effects and acupuncture has better individual effect when compared with the use of herbal medicine alone [17].

v. A special meridian and acupuncture points have been identified as particularly effective for withdrawal therapy [18].

vi. Electrical stimulation in Acupuncture might have better results [19].

vii. Acupuncture is found to be useful not only as a detoxification agent, but might help preventing relapses [20].

Given all the positive indications revealed in the literature search, it might be interesting to compare the observations made in properly organized reviews with reference to the conventional therapeutic measures of opioid detoxification. A Cochrane review done in 2006 [8] on the effectiveness of adrenergic antagonists showed the following:

i. The effects of clonidine were obvious although side effects of hypotension and dizziness were frequent.

ii. No other adrenergic antagonist seemed to work better than clonidine.

iii. Addicts on the MMT regime experienced better effects with adrenergic-antagonists.

On the other hand, looking through some of the details of the acupuncture records, the following facts could further support its applications [14-20]:

a. Most of the acupuncture treatments were given in hospital or retention home settings.

b. The form of acupuncture included simple needling, electrical stimulation or together with moxibustion.

c. The duration of acupuncture treatment lasted 1-3 weeks.

d. The assessments included the Standard Withdrawal Symptom Score (WSS) the Patients' Detoxificated Number (PDN); adverse effects incidence; relapse rate; anxiety and long term effects. These data tended to be complicated and only simple observations could be made on the preferential choices of different forms of treatment. However, it is obvious that safety is not an issue at all.

e. Only a few trials attempted to go long term. One trial indicated a 28% relapse rate for the combined treatment of Methadone with acupuncture, compared with a 57% relapse in Methadone alone.

An analysis of the acupuncture meridian and acupoints used is useful. The following should be noted:

a. Most acupoints used fell within the Du Mai channel (24%), Urinary bladder channel (15%) and Ren Mai channel (9%).

b. Commonly used body acupoints included:

c. Neignan (PC 6), Zusanli (ST 36), Hegu (LI 4), Sanyinjiao (SP 6), Laogong (PC 8), Shemen (HT 7) Waignan (SJ 5), Shenshu (BL 23), Baihui (DU 20), Dazhui (DU I4).

d. Commonly used auricular acupoints included:

e. Liver, Kidney, Endocrine, Lung, Heart, Brainstem, usually together with body points. Auricular points were either punctured with short needles which could be retained. Alternatively, small hard beads could be taped onto the ear-lobe for self-pressure manipulations [16].

f. Duration of puncture varied from 15 to 60 minutes.

1.5. Mechanism of action of acupuncture as means of detoxification

Heroin addicts have acquired high concentrations of exogenous opiates which in turn inhibit the bioactivities of endogenous opioid peptides in the central nervous system. Once the exogenous opiate level declines, the endogenous system fails to adapt to the normal needs for homeostasis. The resulting dysfunction initiates the withdrawal symptoms and yearning desire for exogenous 'refill' of opiates [21].

1. Acupuncture helps to regulate the normal bodily function through the following mechanisms:Endorphin release: Acupuncture increases the release of endogenous opiate like substances, including endorphin, enkephalin, dynorphin in the cerebral tissues and nerve cells.

2. 5 hydroxy tryptamine release: With acupuncture stimulation, the 5 hydroxy tryptamine pathway in the hypothalamus is stimulated to release dopamine which is related to the feeling of euphoria with which the withdrawal syndrome is counteracts [22].

While the modern neuro-physiology and related humoral theories could throw some light into the scientific mechanism of acupuncture and withdrawal symptoms, they are yet insufficient

to offer the comprehensive explanations. The traditional theories of acupuncture, however, could supplement some basic understandings.

The Du Mai and Ren Mai, are Extraordinary Channels, governing, connecting and regulating the Twelve Ordinary meridians, running through the human body, harmonizing physiological functions to maintain homeostasis. The Urinary Bladder Channel on the other hand, connects the kidney with the Urinary Bladder and it is the most important system coupling the interior to the exterior according to the classical theory in Chinese Medicine. In particular, the Du Mai has the principal role for the treatment of mental diseases, febrile illnesses, and musculo-skeletal problems. Clinical observations showed that the acupoint-stimulation on the Du Mai effectively alleviates the withdrawal symptoms, such as muscularskeletal pain, perspiration and anxiety. Acupuncture using points located on Du Mai tonifies the Qi which maintains normal functional activities of the body [23, 24].

The Ren Mai is described as a sea of Yin which regulates metabolisms and blood function in the human body. It maintains the connection among the other organ's function including Lung, Heart, Liver, Spleen and Kidneys [25]. The selected acupoints for detoxification purposes within these three popular meridians are mainly those related to pain control, the nervous system, cardiovascular system and digestive system.

1.6. Discussion

Detoxification is a treatment offered to opiate addicts in support of their attempts to withdraw from addicted drug. There is obviously a need in medical and health services in response to the rising challenges of drug abuses in modern sociaty. However, using traditional medicine or acupuncture in Detoxification, has not been a serious consideration.. Traditional Chinese Medicine practitioners might have used herbs or acupuncture for the relief of symptoms of pain, nausea and vomiting when the need arises among the few opiate abusers. The first properly recorded application of acupuncture used systematically for withdrawal symptoms might have been originated in Hong Kong in the 1970's when a neurosurgeon used auricular acupuncture for this purpose [26, 27]. Subsequently using acupuncture to treat symptoms addicts invited more and more medical and community interests, so that more and more trials were initiated.

Up to today, there is yet no treatment program that guarantees the success of detoxification and subsequent total withdrawal from opiate/heroin addiction with no relapses. Methadone substitution is accepted as a standard offer while the limitations remain. Alternative treatment like acupuncture, could be considered a valid option of detoxification using with methadone or alone. Evidence of using acupuncture for pain, nausea and vomiting, and some other withdrawal symptoms has been accumulating and the treatment is easy, cheap and safe. We are not yet clear, whether the long term results, including relapses, are favourable. Given the complexity of drug abuse includepersonality, psychosocial influences, and health related etiologies, it is hard to establish simple solution to this problem. Acupunctures, with the adventage of least investment and highest safety, could be accepted as a favourable option and research could concentrate on the modalities of combined treatment which might give better chances of cure.

2. Cigarette addiction

Smoking has developed gradually from a fashionable social activity to a hateful anti social behaviour in recent years. Those who are addicted to Cigarette smoking might be facing bitter pressure to seriously engage in quitting attempts. The most determined individuals might find little difficulties in the quitting endeavours. There are however, personal and social reasons barring the success of such quitting determinations [28].

This section describes the use of self-administered acupressure as a means to help quitting smoking, through the experience of a pilot study on the same subject completed in Hong Kong.

2.1. Introduction

According to the information gathered by the Hong Kong Census and Statistics Department in a thematic household survey during December 2007 to March 2008 [29], there were 679,500 daily smokers, accounting for 11.8% of all persons aged 15 years and older in Hong Kong. Among them, 99.6% were cigarette smokers, consuming an average of 14 cigarettes per day. A third of daily smokers had tried but failed to quit smoking. The 3 most commonly cited reasons for failure were ''not determined enough'', ''cigarette smoking had formed a favorite habit'', and ''friends/colleagues were also smokers''.

The new amendment of the Smoking (Public Health) Ordinance [30] became effective January 1, 2007; no-smoking areas have been extended by law to cover the indoor areas of all restaurant premises, indoor workplaces, public indoor places, and also some public outdoor places. On July 1, 2009, the no-smoking area was further extended to recreational venues to provide protection against ''secondhand smoking'' in indoor workplace and public places. Through public education, health campaigns, and government legislation, smoking has become less socially acceptable as people become more health conscious. The service to aid smoking cessation thus becomes highly significant and demanding.

There are a number of ways to help smokers stop this habit such as anti-smoking advice given by physicians, self-help materials, behavioral therapy, nicotine substitutes (nicotine replacement therapy), and other adjuvant therapy including hypnosis, smoking deterrents, nicotine gum, etc [31]. However, the efficacy of such therapies in terms of cost, adherence, side effects, and personal preference varies. Acupuncture has been used to treat drug and alcohol dependence since the 1970s. Acupuncture has also been used to help cigarette consumers quit smoking; the specific aim is to reduce withdrawal symptoms [32-34]. While acupuncture is gaining worldwide popularity, health clinics and natural healing clinics in various countries have started to provide acupuncture as a treatment for smoking cessation.

In this pilot study, a prospective method using auricular acupressure was established to investigate the outcome on smoking cessation among community smokers in Hong Kong. Acupressure, an alternative maneuver to acupuncture, is a simple and easy technique. Instead of using needles to deeply stimulate selected acupoints on the external ear, small hard beads were attached with adhesive tapes and placed against the points so that patients could apply

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pressure on the beads at regular intervals. Acupressure has the additional advantage of avoiding bleeding and infection of the punctured sites.

2.2. Methods

2.2.1. Design

The smoking cessation study was approved by the Clinical Research Ethics Committee of the Chinese University of Hong Kong. All participants were required to give written informed consent before the trial started. The blocked randomization scheme was used to allocate participants in equal proportions to the active treatment or sham groups. Participants were recruited from outpatient clinics and the community through poster advertisements. Eligible individuals had to be aged 18 years or older, have a daily cigarette smoking habit, and be motivated to quit smoking. They could not use other smoking cessation therapy simultaneously.

2.2.2. Intervention

Auricular acupressure was introduced via hard beads fixed with adhesive against the selected acupoints to provide continuous stimulation. Four acupoints on the external ear—Shenmen, Lung, Mouth, and Brain—were used [35]. In addition, 2 more acupoints on the hand—Hegu and Neiguan—were similarly taped with hard beads. For the sham group, non-specific non-meridian points were chosen away from those selected for the treatment group. Figure 1 shows the positions of the acupoints.

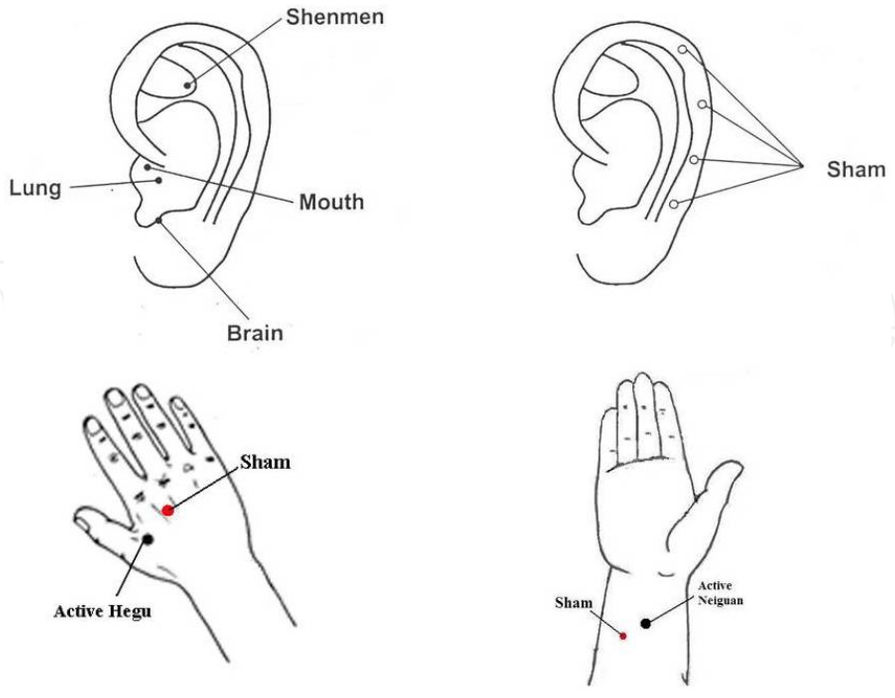


Figure 1. Active auricular points and sham points.

Participants were instructed to press on the beads repeatedly at least 3 times a day or whenever they desired to smoke during the 3 weeks of treatment. They were then followed up weekly during the treatment period, 7 days after treatment was completed, and 3 months after treatment via phone interview.

2.2.3. Assessments

Baseline characteristics and participants' smoking history were collected. A Chinese version of the Fagerstrom Test was administered to measure the magnitude and profile of nicotine dependence [36]. Participants' attitude toward smoking cessation was assessed by a validated questionnaire (Contemplation Ladder) [37].

Individual cigarette withdrawal symptoms were assessed by Mood and Physical Symptoms Scale (MPSS) [38 - 40], which was developed in the early 1980s and variants of it have been used for 20 years. It is composed of 2 parts: the first part rates the severity of depressed mood, irritability, restlessness, hunger, difficult concentrating, and constipation (5 points); the second part rates smoking urges by ''time spent in urge to smoke'' and ''strength of urge to smoke'' (6 points). Other physical illnesses were also recorded weekly. The participants' cigarette consumption was obtained by daily selfreports and also objectively verified through breath carbon monoxide monitor (Bedfont Micro Smokerlyzer, United Kingdom) [41]. The measurement of exhaled carbon monoxide levels in parts per million (ppm) was based on the conversion of carbon monoxide to carbon dioxide over a catalytically active electrode. Data of ≥10 ppm of carbon monoxide indicated smokers; 6–10 ppm indicated sporadic smokers, and <6 ppm indicated non-smokers [42, 43]. Participants could not smoke at least an hour before taking the breath test.

2.3. Statistical analysis

The data analysis was based on intention-to-treat. Comparisons were performed using the t-test and paired t-test for continuous variables; Pearson's test and Fisher's exact test were used to compare categorical variables. A 2-tailed P value <.05 was considered significant. All statistical analyses were performed using SPSS version 16.0 (SPSS Inc., Chicago, IL).

2.4. Results

From November 2007 to March 2009, 70 eligible participants were enrolled in the pilot trial. The participants were predominantly men (70%). The mean age was 46.5 years with a mean smoking period of 27.8 years (range, 5-50 years). The mean (SD) cigarette consumption was 16 (7.19) per day. The mean (SD) breath carbon monoxide level was 15.06 (7.56) ppm at the start of the study. Past quitting attempt was 0.94 times.

According to the Fagerstrom nicotine dependence test, 33% of participants were severe, 36% were moderate, and 31% mild. For the degree of motivation to quit smoking, 32.9% of participants were either prepared or determined to take action. There were no major differences between the active and sham groups at baseline level (Table 1).

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Participant adherence to the intervention was as follows: 87% (61) attended the first visit, 80% (56) the second visit, 76% (53) the third visit, and 73% (51) kept all 4 appointments. Participants manipulated the acupressure points on average 4.22 times a day in the active group and 5.12 times a day in the sham group.

		Active	Sham	Total	P
		N = 38	N= 32	N= 70	value
Sex	Male(%)	26 (68.4)	23 (71.9)	49 (70)	0.753
	Female(%)	12 (31.6)	9 (28.1)	21 (30)	
Age	Mean (SD)	46.5 (12.36)	16.4 (11.36)	46.5 (11.82)	0.958
	30 or Less(%)	5 (13.2)	4 (12.5)	9 (12.9)	0.707
	31-60(%)	27 (71.1)	25 (78.1)	52 (74.3)	
	61 or Above(%)	6(15.8)	3(9.4)	9 (12.9)	
Smoking History	Mean Smoke Yr (SD)	27.11 (11.39)	28.53 (11.50)	27.76 (11.38)	0.605
	Range	6 - 46	5 - 50	5 - 50	
Cigarettes per day	Mean Stick(s)/day(SD)	14.50 (6.33)	17.94 (7.77)	16.07 (7.19)	0.045
	Range	5 - 33	5 - 50	5 - 50	
Contemplation Ladder	Less Determination(%)	28 (73.7)	19 (59.4)	47 (67.1)	0.204
	More Determination(%)	10 (26.3)	13 (40.6)	23 (32.9)	
Fagerstrom Score	Low (0-3)(%)	15 (39.5)	7 (21.9)	22 (31.4)	0.244
	Moderate (4-5)(%)	11 (28.9)	14 (43.8)	25 (35.7)	
	Severe (6-10)(%)	12 (31.6)	11 (34.4)	23 (32.9)	
	Mean Score(SD)	4.0 (2.48)	4.75(2.50)	4.34(2.50)	0.214
CO level	Mean CO ppm (SD)	13.68 (7.13)	16.69 (7.84)	15.06 (7.56)	0.098
	Range	1, 31	2,36	1, 36	

SD, standard deviation; ppm, parts per million.

Table 1. Participant Characteristics

Three individuals dropped out because of skin irritations under the adhesive tapes. Other reasons for discontinuation included external appearance of the tapes, busy working schedules, and other personal matters.

The effectiveness of acupressure was free of smoking by end of treatment and point prevalence of smoking cessation at 7 days following treatment completion. Success in quitting was defined as discontinuation of the smoking habit and the breathing test for carbon monoxide level

showing less than 6 ppm. Failure was defined as a continuation of the smoking habit or absence from follow-up [43].

The successful rate of discontinuation at the end of treatment was 2.6% (1) and 9.4% (3) (P =. 33); 7 days post treatment it was 5.3% (2) and 6.2% (2) (P =.86), and 3 months post treatment it was 7.9% (3) and 3.1% (1) (P =.62) for the active and sham group, respectively. For the breathing test, only 65 individuals whose carbon monoxide level at pretreatment was higher than 6 ppm were analyzed. At the end of treatment, 18.2% (6) of the active group and 16.7% (5) of the sham group showed carbon monoxide levels of less than 6 ppm (P =.87); at 7 days post treatment, the active group was 25.8% (8) and sham group was 16.1% (5) (P =.35). There was no statistically significant difference between the groups.

Although some participants could not quit smoking completely, 30.9% (21) of them (35.1% (13) of the active group and 25.8% (8) of the sham group) succeeded in reducing 50% of their daily cigarette consumption at 7 days following treatment. The mean number of cigarettes smoked daily and the carbon monoxide expiration level decreased significantly from pre-treatment values in both groups (Figure 2 and 3). The mean cigarette reduction was 45.9% for the active group and the 43.7% for sham group. There was no statistically significant difference between the groups.

At 3 months post treatment, 25 of 51 participants were reached via phone interview. Twenty of them smoked less than at baseline; those belonging to the active group were smoking less (–9.17±7.5) than the sham group (–3.5±7.4; P =.07; Figure 4).

Cigarette withdrawal symptoms were measured, including depressed mood, irritability, restlessness, hunger, difficulty concentrating, and constipation along with the urge and the strength of urge to smoke. During the 3-week treatment period, more than 60% of individuals experienced more than 1 withdrawal symptom and most of them had the problem of hunger. The overall mean score was around 8 to 10 (score range, 6–30), meaning that the participants were tolerating the withdrawal symptoms reasonably well. The mean of the total urges was around 5; (Figure 5) demonstrates the pattern of the scoring. There were no statistical differences between the 2 groups in the withdrawal symptoms and urges (Table 2).

Subgroup analyses (Table 3) were performed with respect to the amount of cigarette consumption, attitude toward quitting (Contemplation Ladder), and dependence of nicotine (Fagerstrom score). None of the outcomes including successful rate of discontinuation of smoking, cigarette reduction, and withdrawal symptoms reached statistical significance between the active and sham group at 7 days post treatment. However, the participants with more determination to stop smoking achieved the greatest magnitude in success rate and percentage of cigarette reduction. At 3 months post treatment, the active group showed a more significant reduction of cigarette consumption than baseline in heavy cigarette consumption subgroup (–13±7.5 vs -3±8.1, $P<.05$), and in high Fagerstrom score subgroup (–10.3±7.6 vs -2.26±6.0, $P<.05$).

Apart from 3 participants who experienced skin allergy at the site of the adhesive tapes, there was no adverse event reported.

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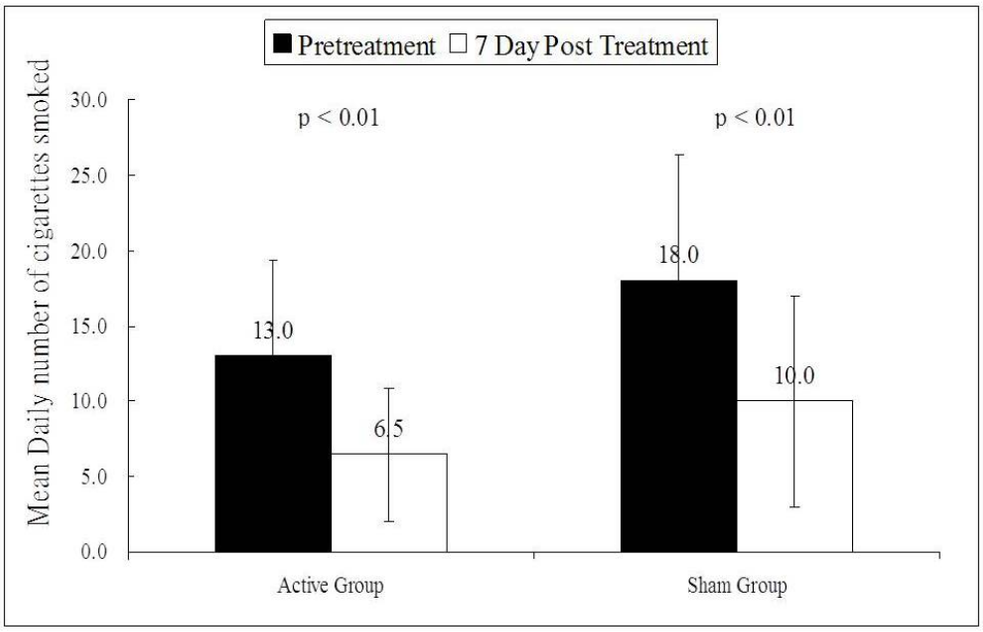


Figure 2. Cigarette consumption at 7 days post treatment.

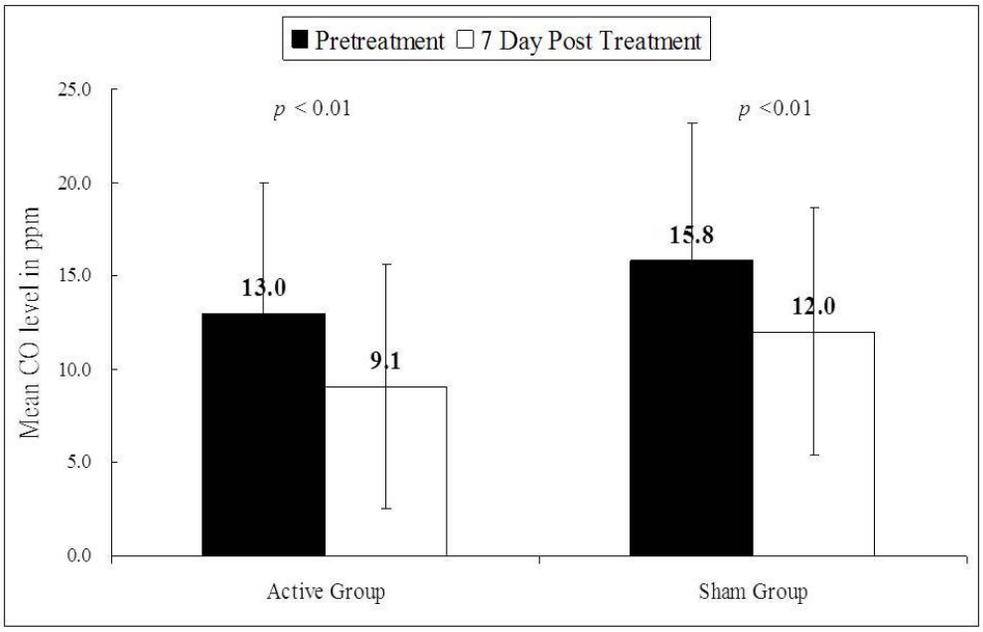


Figure 3. Carbon monoxide expiration at 7 days post treatment.

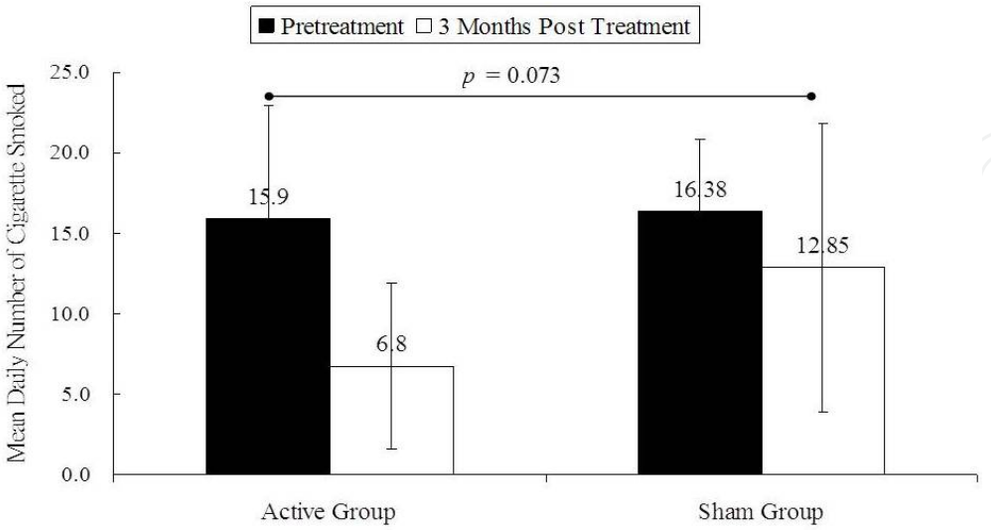


Figure 4. Cigarette consumption at 3 months post treatment.

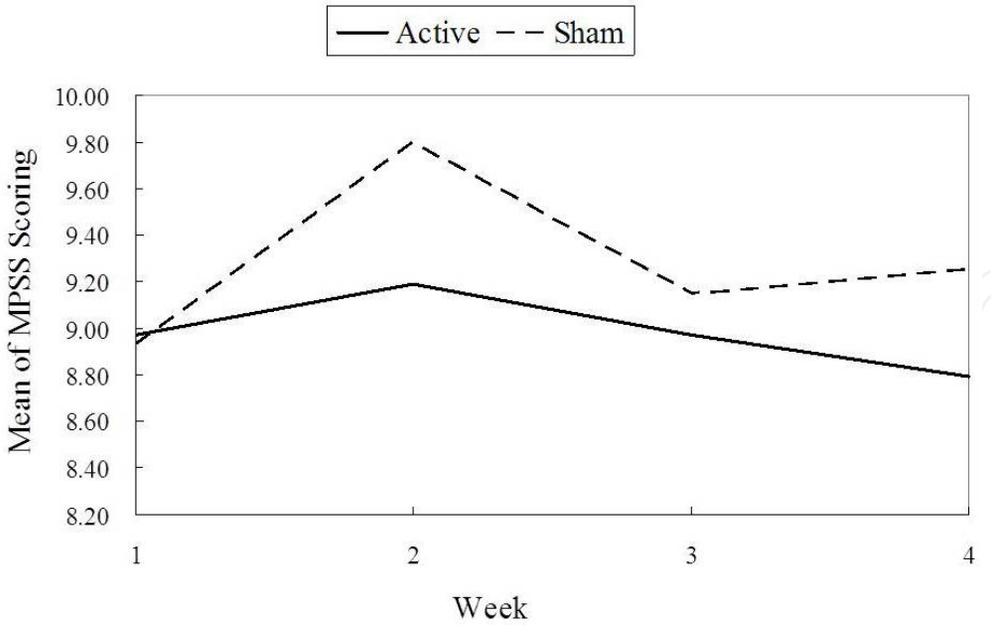


Figure 5. Withdrawal symptoms scoring pattern.

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	Week after first treatment		Second Week		Third Week		7 days post treatment	
	Active	**Sham**	**Active**	**Sham**	**Active**	**Sham**	**Active**	**Sham**
Overall Score Mean (SD) †	8.97 (3.06)	8.93 (3.65)	9.19 (3.35)	9.80 (4.39)	8.97 (3.64)	9.15 (3.77)	8.79 (2.91)	9.25 (4.05)
Total Urge Score Mean(SD)‡	4.26 (1.64)	3.89 (1.74)	4.03 (1.51)	4.24 (1.56)	3.95 (1.51)	3.92 (1.84)	3.79 (1.60)	3.92 (1.84)
Any Withdrawal Symptom	27 (79.4%)	17 (63.0%)	22 (68.8%)	19 (73.1%)	19 (61.3%)	21 (80.8%)	22 (79.6%)	20 (83.3%)
Depressed	1 (2.9%)	4 (14.8%)	4 (12.5%)	6 (24.0%)	4 (12.9%)	5 (19.2%)	3 (10.7%)	5 (20.8%)
Irritability	5 (14.7%)	3 (11.1%)	3 (9.4%)	3 (12.0%)	5 (16.1%)	4 (15.4%)	4 (14.3%)	4 (16.7%)
Restlessness	4 (11.8%)	5 (18.5%)	6 (18.8%)	6 (24.0%)	3 (9.7%)	4 (15.4%)	3 (10.7%)	3 (12.5%)
Hungry	11 (32.4%)	6 (22.2%)	11 (34.4%)	7 (28.0%)	9 (29.0%)	5 (19.2%)	6 (21.4%)	5 (20.8%)
Difficult in Concentration	3 (8.8%)	5 (18.5%)	4 (12.5%)	6 (24.0%)	5 (16.1%)	6 (23.1%)	2 (7.1%)	5 (20.8%)
Constipation	3 (8.8%)	1 (3.7%)	4 (12.5%)	2 (8.0%)	3 (9.7%)	0 (0%)	1 (3.6%)	3 (12.5%)

†Overall Score Range 6 to 30 ; ‡Total Urge Score Range 0 to 10.

Table 2. Mood and Physical Symptoms Scale overall scoring and proportion with severity rated moderate to severe.

	Cigarette Consumption		Readiness to Quit		Fagerstrom Score	
	Less than 15 sticks	**Above 15 sticks**	**Less Determination**	**More Determination**	**Low**	**Moderate to Severe**
	A vs S	A vs S	A vs S	A vs S	A vs S	A vs S
At 7 days Post Treatment	n = 25	n = 45	n = 47	n = 23	n = 22	n = 48
Successful Rate	5.0% vs 0%	5.6% vs 7.4%	3.6% vs 5.3%	10.0% vs 7.7%	6.7% vs 14.3%	4.3% vs 4.0%
Cigarette Reduction	38% vs 32.9%	60.2% vs 45.9%	38.8% vs 39.4%	61% vs 49.1%	49.4% vs 54.6%	43.3% vs 41.3%
Overall Withdrawal Symptom Score Mean ± SD	8.89±3.03 vs 9.5±2.38	8.6±2.84 vs 9.2±4.35	8.37±2.50 vs 9.31±3.92	9.67±3.64 vs 9.18±4.38	8.33±2.64 vs 7.60±1.14	9.13±3.14 vs 9.68±4.43
Total Urge Score Mean ± SD	3.67±1.78 vs 3.75±2.06	4.0±1.25 vs 3.95±1.85	3.79±1.40 vs 4.15±1.57	3.78±2.05 vs 3.64±2.16	3.08±1.68 vs 2.80±1.30	4.31±1.35 vs 4.21±1.87
At 3 Months Post Treatment N=25	n=8	n=17	n=14	n=11	n=4	n=21
Cigarette Reduction Compared with Pre-treatment Mean ± SD	-5.33±5.79 vs -4.5±2.12	-13±7.46 vs -3±8.10†	-8.14±8.15 vs -4.29±1.38	-10.6±7.16 vs -2.67±11.34	3.5±4.94 vs 10±14.14	10.3±7.6 vs 2.36±6.04†

A, Active group; S, Sham Group; † $P < 0.05$.

Table 3. Subgroup Analyses on Cigarette Consumption, Readiness to Quit and Fagerstrom Score

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2.5. Discussion

This pilot study sought to determine whether auricular acupressure could be an effective anti-smoking intervention and if it could help with the relief of withdrawal symptoms. Although there was a lack of statistical evidence to support the efficacy of the active treatment, both active and sham groups revealed a large reduction in the number of cigarettes consumed, confirmed by a substantial reduction of the carbon monoxide level in the breathing tests. As revealed from the Contemplation Ladder estimation at pretreatment, 67% of participants were still in the precontemplation and contemplation stage (i.e., they were not yet totally committed to quit smoking). For such participants, counseling programs could help achieve better results. The low absolute cessation rate in our study may be related to the relative lack of determination among our patients.

Although withdrawal symptoms were commonly experienced by chronic smokers who wanted to quit, our participants' withdrawal symptoms were not severe and did not increase as time elapsed.

A report given by the Smoking Cessation Health Centre in Hong Kong 2001 [44] revealed that by providing individual counseling and nicotine replacement therapy (nicotine gum, patch, or inhaler) to participants, after 1 month, 26% of participants successfully quit smoking, 48% reduced their average consumption of cigarettes, and 18% did not change their smoking habits at all. Compared with our completed study at 7 days post treatment, 30.9% of participants halved their daily cigarette consumption, but only 5.7% successfully discontinued smoking. In another survey done in 2001 [45] with regard to the determination to quit smoking, the proportion of pre-contemplation and contemplation decreased from 71% at baseline to 42% at 3-month follow-up. This observation perhaps demonstrated the effects of individualized behavioral counselling. Four weeks of nicotine replacement therapy provided in one other study resulted in only 16% adherence [28]. In our auricular acupressure study, patients' adherence was encouraging and reached 73%. The positive attitude of the participants on acupressure supports further exploration of its use as an option for smoking control.

The sham points chosen for the control group were meant to be really inert to stimulation. However, this sham group also showed a prominent reduction in cigarette consumption as did the active treatment group using known acupoints with targets. It is uncertain, whether the sham points also elicite stimulation on applying pressure. One has to realize that the sham points are in fact very near the target points. The Cochrane review on acupuncture and related intervention for smoking cessation done in 2005 revealed that there was no consistent evidence that acupuncture was superior to no treatment, and there was no evidence that the effects of acupuncture were different from that of other anti-smoking interventions, or that any particular related technique was superior to other techniques [34]. Our study did not show significant results between the acupressure and sham group.

As in other reported studies, we had difficulty getting the absolute results of the smoking cessation attempts [46]. To evaluate the effectiveness of smoking cessation, interven-

tions neither participants self-report on cigarette consumption nor carbon monoxide breath test is absolutely reliable. The result may be biased due to faulty memory or intentional biases. Moreover, the carbon monoxide breath test only indicates recent exposures of smoking (it has only, 6–9 hours short half-life, and faces rapid disposition). Each individual breath test taken during follow-up visits varied from participant to participant, i.e. the test could be taken in the morning or after a meal, which give lower readings. Other more reliable approaches such as plasma and urine nicotine concentrations, which are more reliable indications of longer exposures of smoking (5–7 days with longer half-life) are available [47]. However, the high costs did not allow their inclusion in our study.

Given that perfect choices are not available, the majority of smoking cessation studies used breath tests instead of a plasma cotinine concentration test, which was also invasive and more expensive. Participants' self-reports on cigarette consumption verified by their carbon monoxide breath tests could therefore be practical means for the evaluation of the effectiveness of acupuncture in smoking cessation.

In conclusion, acupressure on the external auricle is a simple maneuver and taking acupoints and sham points together, the positive results reached promising levels. Acupressure is a safe technique for all smokers who want to quit smoking, including pregnant and breastfeeding women, while nicotine replacement therapy might not be as safe and acceptable. Acupressure as a means to help stop smoking may therefore be recommended as a valid option.

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