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In the spotlight

Acupuncture for addicted patients with chronic histories of arrest A pilot study of the Consortium Treatment Center

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Abstract

Auricular acupuncture continues to gain popularity as an adjunct to substance abuse treatment. This report describes an outcomes study in a treatment center tailored to the needs of chronic repeat offenders. Thirty-seven patients who received acupuncture (AC) during the early weeks of treatment were followed for 180 days postadmission. Data were collected for four parameters: (1) program retention, (2) new arrests incurred, (3) drug-positive urinalysis results, and (4) number of days needed to progress from entry level to secondary level treatment. These data were compared to archived information from 49 no-acupuncture (NA) patients who had entered the program before acupuncture became available. Chi-square tests determined that AC patients exhibited significantly higher program retention than NA patients at 30 ($p < 0.0001$), 60 ($p < .002$), 90 ($p < .001$), 120 ($p < .007$), and 150 ($p < .031$) days. At 180 days, a higher percentage of AC patients than NA patients remained in treatment, but the difference was not significant. Kaplan–Meier survival analysis determined that AC patients had significantly higher cumulative probability of remaining in treatment than did NA patients ($p < .0021$). In AC patients, there were decreased numbers of new arrests, drug-positive urinalysis results, and days needed to advance in treatment, but the differences were not significant. Fifty-one percent of all patients named methamphetamine as their primary drug of choice. Regardless of treatment group, methamphetamine-addicted patients exhibited significantly lower program retention than patients addicted to all other drugs ($p < .035$). In methamphetamine-addicted patients, acupuncture improved program retention only up to 30 days ($p < .021$). These findings support addition of acupuncture to substance abuse treatment for criminal justice clients and indicate a need for acupuncture research focusing on withdrawal from methamphetamine.

Keywords: Acupuncture; Addiction; Outcomes; Corrections; Methamphetamine

1. Introduction

The current practice of prescribing acupuncture to alleviate symptoms of drug withdrawal germinated in 1972, when H. L. Wen, a neurosurgeon from Hong Kong, visited China to learn acupuncture anesthesia. One technique that he learned involved mild electrical stimulation of acupuncture needles, which reduced or eliminated the need for anesthetic drugs during surgery. This treatment was given in a series over several weeks prior to surgery, as well as during procedures. Upon returning to his Hong Kong practice, Wen employed acupuncture anesthesia to treat surgical patients with no knowledge that some were addicted to heroin, opium, morphine, alcohol, and/or nicotine. The addicted patients later volunteered this information, stating that during the weeks they received acupuncture treatments, they also lost their drug cravings. Wen and colleagues followed up by treating 40 patients for opium and heroin addiction. Of the 40, 39 were considered improved in that they had gained needed weight and reported they did not crave drugs (Wen, 1979; Wen & Cheung, 1973; Wen & Teo, 1975). Patterson (1975) in England and Nogier (1983) in France subsequently found that prescribed combinations of acupuncture points and electrical stimulator frequencies could be varied to target withdrawal symptoms associated with specific drugs of abuse (reviewed by Dale, 1993).

However, for acupuncture to be adopted into standard addiction clinic practices, it needed to be more affordable and less labor-intensive/time-consuming. To meet these requirements in the United States, Smith and coworkers (Smith, 1979, 1988a, 1988b, 1992; Smith & Aponte, 1984; Smith &

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Khan, 1988; Smith et al., 1982, 1986) modified Wen's original protocol by eliminating electrical stimulation and by using an abbreviated prescription of five needles inserted at specific points on both outer ears (auricles). This prescription was not designed for withdrawal from any class of drug or any single abused substance. Instead, it effectively reduced cravings, anxiety, and dysphoria of withdrawal in addicted patients during withdrawal from a variety of drugs and alcohol. Patients consistently reported the most dramatic relief during the early weeks of withdrawal, when the danger of relapse is highest. Thereafter, as the course of withdrawal followed its natural history and acute symptoms abated, acupuncture continued to reduce anxiety and cravings associated with protracted withdrawal. In fact, patients who have completed addiction programs have often continued to enjoy stress reduction induced by occasional "booster" acupuncture treatments. By 1974, Smith had adopted this five-point auricular protocol as the sole detoxification method used in the outpatient clinic at Lincoln Hospital in the Bronx, NY. Over the past 25 years, this acupuncture protocol has grown in popularity. It is currently used to treat alcohol and other drug (AOD) withdrawal in more than 800 substance abuse treatment centers across the United States and Europe (Renaud & Renaud, 1998). The results of using acupuncture in these centers has generally been reported as "good" at meetings of the National Acupuncture Detoxification Association (NADA), in *Guidepoints*, (an independent monthly subscription newsletter), and via word of mouth.

Nevertheless, there is a paucity of information on rigorous studies in peer-reviewed journals. At this writing, Columbia University is the hub of an on-going multi-center trial on acupuncture effects on withdrawal from cocaine. Those results are eagerly awaited and will be important to the field of addiction acupuncture.

Two randomized trials have compared the effects of auricular acupuncture at either specific points for the treatment of substance abuse or at sham points. The results of both trials were encouraging. Severe recidivist alcoholic patients treated with acupuncture specifically for the treatment of substance abuse reported less craving for alcohol, fewer drinking episodes, and required fewer admissions to the county detoxification center than did control patients who received acupuncture at nonspecific points (Bullock et al., 1987, 1989). Preliminary reports of the successful use of auricular acupuncture to treat withdrawal in patients addicted to cocaine, crack-cocaine, and heroin, as well as in polyaddicted patients, have also engendered the belief that auricular acupuncture can be a useful adjunct to standard treatment of AOD addiction (Ackerman, 1995; Brumbaugh, 1993; Bullock et al., 1987, 1989; Konefal et al., 1994, 1995; Smith, 1979, 1988a; Taub, 1993; Washburn et al., 1993). On the other hand, possible acupuncture effects on withdrawal from numerous drugs, including methamphetamine, hallucinogens, and assorted "designer drugs" have yet to be examined.

In parallel with these results, acupuncture treatment for substance abuse has entered the judicial system as well. First, auricular acupuncture treatment was introduced into a corrections setting in 1986, when the Lincoln Hospital outpatient program was expanded to accommodate a New York City court referral system. In 1990, acupuncture was adopted as an adjunct therapy component of the highly successful Miami Drug Court. The drug court model is based on the rapid diversion of first-time offenders to treatment (Finn & Newlyn, 1993; Goldkamp & Weiland, 1993). The Miami model, including the option to use acupuncture, has been adopted by approximately 50 cities in the United States. Acupuncture has also been used, or is currently in use, in the in-custody AOD treatment programs in the jail and/or prison systems of Austin, TX; Baltimore, MD; Chicago, IL; and the states of Connecticut and Minnesota. In Europe, there are seven similar in-custody programs in the United Kingdom, six in Sweden, and two in Italy (Renaud & Renaud, 1997). There is little information in peer-reviewed literature about the success of these programs, but presentations at NADA meetings are consistently encouraging.

Court-mandated patients, however, particularly chronic repeat offenders, represent a highly challenging population for substance abuse treatment. These patients tend to be antagonistic toward treatment and poorly motivated to remain in recovery (Brochu et al., 1999; DeLeon, 1991). Frequently, they commit new crimes during treatment intervals, resulting in arrest and incarceration and interrupting full participation in treatment (Clarke et al., 1996). Significantly, we have found no reports of acupuncture treatment in programs tailored to the needs of these outpatient chronic offenders. In fact, very few studies that validate the use of acupuncture in alcohol/drug treatment can be found at all. Therefore, we chose to test the efficacy of acupuncture in this particularly difficult population.

2. Hypothesis

The hypothesis of this study is that incorporation of acupuncture into the treatment of newly admitted, substance-abusing, chronic, repeat offenders would improve program outcomes as measured in (a) increased patient retention, (b) reduced numbers of arrests, (c) more drug-free urinalysis results, and (d) decrease in the number of days needed for successful patient progress from entry level to secondary level in a four-tiered program.

3. Methods

In Klamath County, OR, the Consortium Treatment Center is the outpatient facility for nonincarcerated repeat criminal offenders with substance abuse problems. All patients are remanded by the court to enroll and complete treatment as a condition of probation or parole. The average treatment duration of patients who successfully complete the program is 335.73 days (SD = 135.82 days), depending upon individual patient needs. Highly motivated patients have gradu-

ated in 5–6 months, but graduation times are not normally distributed and are skewed toward longer stays. The standard treatment regimen is highly structured and consists of four progressive tiers or levels. It incorporates the Hazelden's "Design for Living" series (Bush & Bilodeau, 1983) as well as Yochelson and Samenow's (Yochelson & Samenow, 1993) "Thinking Error" material. Patients are held accountable for participation in treatment. In addition, criminality is treated as an addiction alongside alcohol and other drugs. Clarke et al. (1996) have published an in-depth description of this model.

Most substance abuse treatment programs have difficulty demonstrating success or failure because longitudinal follow-up is often impracticable. Fortunately, the Consortium Treatment Center was originally an experimental program funded by the U.S. Department of Health and Human Services Center for Substance Abuse Treatment (CSAT). Precise records were required for many parameters, including attendance, arrests, urinalysis results, progression toward graduation, aftercare, and results of the Addiction Severity Index (Urschel et al., 1993) evaluations. These data were regularly reviewed by an outside evaluator with progress reports subsequently submitted to CSAT (Pohl, 1996, 1997). This painstakingly organized and updated record system created a fertile field of baseline data for research. An outcomes study in which subjects who received intervention (acupuncture) could be rigorously compared to historical controls who had received standard care.

Thus, on December 3, 1996, acupuncture was added to the treatment protocol for entry-level patients at the Consortium Treatment Center. This report focuses on a group of patients ($N = 37$) whose admission to treatment fell within the first 5 months of the acupuncture intervention (December 3, 1996–May 3, 1997). For our analyses, this cohort is referred to as the acupuncture (AC) group. The no-acupuncture (NA), or control, group consisted of patients ($n = 49$) whose admission dates fell within the 5-month period (July 1–November 30, 1996) just prior to the adoption of acupuncture. All patients were followed to 180 days past their respective admission dates. This study was reviewed and approved by the Human Subjects Institutional Review Board at Merle West Medical Center, Klamath Falls, OR.

Patients in both groups were evaluated upon admission to treatment by treatment center staff using a modification of the Addiction Severity Index. Demographic information was also collected. Written informed consent was obtained as part of the Consortium's Consent to Treat agreement. All patients received the standard outpatient care given by the Consortium Treatment Center as described briefly above. AC patients received educational material describing acupuncture treatment during their intake interviews and were encouraged to ask questions by the intake caseworker. Patients in the NA group were admitted before acupuncture was adopted as part of treatment but were encouraged to ask questions about all available treatment options. NA patients attended the meditation period routinely observed during the first hour of the treatment day, while patients in the AC group were given acupuncture in a separate room during the meditation period.

During acupuncture treatment, patients sat in high-backed chairs, which would recline to approximately a 45° angle to enhance relaxation if desired. Patients cleansed their own ears with alcohol swabs. Then the licensed acupuncturist inserted five thin, sterile, disposable needles into the cartilage of each ear at points consistent with the standard detoxification protocol approved by the NADA. Needles were left in place for 45 minutes, during which there was no talking while quiet music played. AC patients were given a three-phase 9-week regimen, which is a modification of the regimen described by Bullock et al. (1987, 1989). The protocol proceeded as follows:

Phase I: Daily, Monday–Friday for 3 weeks (total = 15 treatments).
Phase II: Every Monday, Wednesday, and Friday for 4 weeks (total = 12 treatments).
Phase III: Every Monday and Thursday for 2 weeks (total = 4 treatments).

4. Statistical analysis

Statistical analysis was performed with SPSS software (release 8.0, SPSS, Chicago). Demographic features for the two groups were compared with use of the Student's *t*-test, and possible relationships between demographic factors and outcomes data were examined with regression analysis. Program retention comparisons were made with chi-square tests at 30, 60, 90, 120, 150, and 180 days postadmission. The cumulative probability of remaining in treatment for 180 days was determined for the two groups with use of the life-table method of Kaplan and Meier (1958), and the results were compared with the generalized Wilcoxon (Breslow or Gehan) (Gehan, 1965) test. Arrest data were normalized by computing a ratio of the number of times each subject was arrested during the 180-day observation period divided by the number of days that subject remained in treatment (up to the 180-day maximum observation period). These data were not normally distributed (not in line with the bell-shaped curve) and were, therefore, further analyzed using the nonparametric Mann–Whitney *U*-test (Conover & Iman, 1981). The Consortium Treatment Program did not have enough money in its budget to include daily urinalysis and resorted to a combination of random and nonrandom urinalysis. Although most patients designated to undergo urinalysis on any given day were chosen on a random basis, if a counselor or case worker suspected drug or alcohol intoxication, a patient could be designated for testing for that reason. To allow for expected abnormalities in the urinalysis data, we computed a ratio of the number of "dirty" urinalyses (i.e., testing positive for drugs) divided by the total times a patient was tested. Urinalysis data for the two groups were also not normally distributed and

were compared with use of the Mann–Whitney *U*-test. The numbers of AC and NA clients who progressed to Phase II were compared using the Student's *t*-test.

5. Results

Outcomes were followed in a total of 86 patients for 180 days following admission. Demographic data from all subjects are summarized in Table 1. Student's *t*-tests revealed no significant differences between controls and acupuncture patients in age, gender, race, number of children, number of children living with client, net monthly income, years of education completed, number of prior treatment programs entered, marital status, employment status, drug(s) of choice, or alcohol, drug, employment, legal, or psychological severity scores. Regression analyses of demographic factors revealed no single factors that would correlate closely with outcomes data in either the NA or AC group. The distribution of preferred drug use between the two groups was similar. Methamphetamine was the primary drug of choice for 44 of the 86 patients. This profile is consistent with Klamath County substance abuse treatment data and police records (Clarke et al., 1996).

Fig. 1 illustrates the percentage of patients remaining in treatment at 30, 60, 90, 120, 150, and 180 days following admission. Chi-square tests revealed that AC patients ($n = 37$) exhibited significantly higher program retention than NA patients ($n = 49$) at 30 ($p < .0001$), 60 ($p < .002$), 90 ($p < .001$), 120 ($p < .007$), and 150 ($p < .031$) days. At 180 days, a higher percentage of AC patients than NA patients remained in treatment, but the difference was not significant.

Fig. 2 illustrates that the AC group ($n = 37$) did have a significantly higher cumulative probability of remaining in treatment up to 180 days than did the NA group ($n = 49$; $p < .0021$).

Due to our observation that patients who were addicted to methamphetamine represented more than half the total sample, we examined data from methamphetamine-addicted patients separately from data of patients addicted to all other drugs including alcohol. Fig. 3 shows the percentages of patients remaining in treatment up to 180 days past their respective admission dates. The percentages of patients retained who claimed methamphetamine as their primary drug of choice were similar to historical controls whether or not they received acupuncture. Overall, irrespective of intervention, methamphetamine-addicted patients stayed in treatment an average of 79.39 days ($SD = 70.31$ days), and other patients remained in treatment an average of 112.26 days ($SD = 70.63$ days). Student's *t*-test revealed this difference to be significant ($t = 2.63$, $df = 84$, $p < .033$). Kaplan–Meier analysis supported this finding in that methamphetamine-addicted patients exhibited significantly lower overall patient retention compared to patients addicted to all other drugs ($p < .035$).

In patients who were addicted to methamphetamine, chi-square analysis showed that acupuncture improved program retention only up to 30 days ($p < .021$) but not at any subsequent time. In patients who were addicted to all substances other than methamphetamine, chi-square tests showed significant improvement at 30 ($p < .003$), 60 ($p < .02$), 90 ($p < .004$), and 120 ($p < .012$) days but not at 150 or 180 days. However, Kaplan–Meier survival analysis determined that acupuncture improved program retention in that group overall ($p < .015$).

Although a decline was observed in the arrests per patient per day and in percent positive urinalyses, neither parameter differed significantly between the NA and AC groups ($p < .84$ and $p < .50$, respectively). Nor did these two particular data parameters (arrests and positive urinalyses) differ significantly between patients who named meth-

Table 1
Patient demographics

	No acupuncture	Acupuncture	Total
Males	35	29	64
Females	14	8	22
Age (years)			
18–30	24	17	41
31–40	19	12	31
41–56	6	8	14
Race			
Caucasian	40	29	69
Black	2	0	2
Native American	6	7	13
Hispanic	0	1	1
Marital status			
Married	10	6	16
Remarried	1	0	1
Widowed	2	2	4
Separated	8	6	14
Divorced	14	12	26
Never married	14	11	25
Number of children			
0	14	10	24
1–3	28	25	53
4–7	7	2	9
Net income/month			
$0–500	44	32	76
$500–1000	5	5	10
Education (years)			
3–8	4	2	6
9–12	43	32	75
>12	2	3	5
Drug of choice			
Alcohol	15	13	28
Methamphetamine	28	16	44
Cocaine	2	0	2
Heroin	2	1	3
Cannabis	2	7	9
Alcohol severity score			
0–5	13	7	20
6–9	36	30	66
Drug severity score			
0–5	3	1	4
6–9	46	36	82
Psychological severity score			
0–5	35	32	67
6–9	14	5	19
Legal severity score			
0–5	4	4	8
6–9	45	33	78

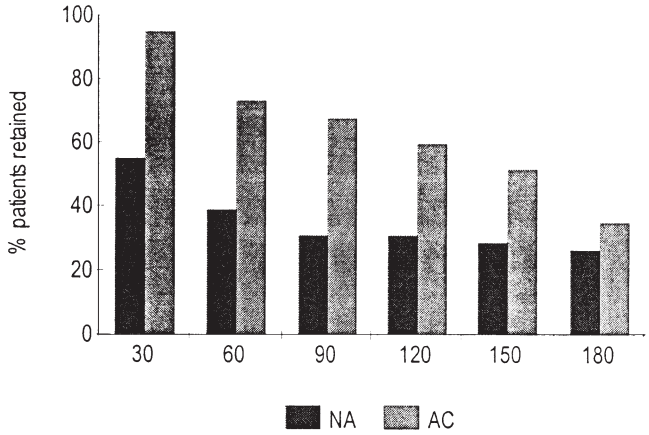

Fig. 1. Patient retention. Chi-square tests determined that patients who received acupuncture (AC) were significantly more likely to remain in treatment than patients who received no acupuncture (NA) for 30 ($p < .000$), 60 ($p < 0.002$), 90 ($p < .001$), 120 ($p < .007$), and 150 ($p < .031$) days following admission. At 180 days after admission, the percentage of AC patients retained in treatment was higher than in NA patients, but the difference was not significant.

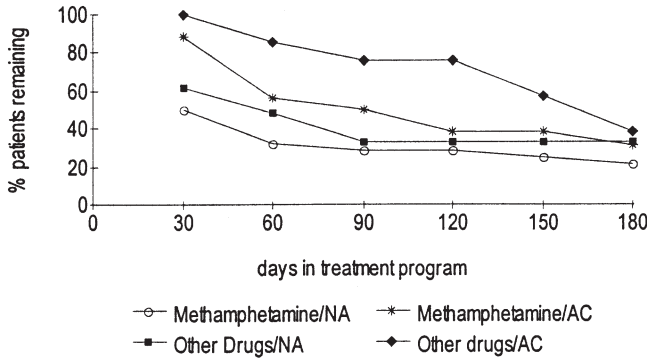

Fig. 3. Methamphetamine versus other drugs. Percent of patients ($n = 86$) remaining in treatment at 30, 60, 90, 120, 150, and 180 days following their respective admission dates. Open circles represent no acupuncture (NA) patients whose primary drug of choice was methamphetamine ($n = 28$). Asterisks represent acupuncture (AC) patients whose primary drug of choice was methamphetamine ($n = 16$). Closed squares represent NA patients who were primarily addicted to any other drug ($n = 8$). Diamonds represent AC patients who were primarily addicted to any other drug ($n = 34$).

amphetamine as their primary drug of choice and patients who were primarily addicted to other drugs.

Table 2 shows that during their respective 180-day post-admission periods, few patients advanced to the Phase II treatment regimen. The average number of days NA patients ($n = 11$) needed to advance to Phase II was 97, and the average number of days it took AC patients ($n = 9$) to advance was 85. Student's *t*-test determined that this difference was not significant.

6. Discussion

The purpose of this study was to determine whether five-point auricular acupuncture treatment changed patient outcomes as measured in the following four parameters: (1) program retention, (2) frequency of arrests, (3) frequency of positive urine drug screens, and (4) time to advancement from entry level to Phase II treatment. The design for this study was not prospective. Patients were not randomized into treatment or nontreatment groups. Therefore, the study was, by necessity, quasi-experimental in nature.

Acupuncture's correlation to improved patient retention was by far the most important finding of this study, as longer stays in treatment for AOD addiction are consistently associated with improved outcomes (Simpson, Joe & Brown, 1997; Simpson, Joe, Broome, et al., 1997). Periodic evaluations by the Consortium Treatment Center's outside reviewer revealed that patients who remained in treatment for 180 days almost invariably enjoyed improved employment status, reduced arrest rates, reduced AOD use, attended community support groups regularly, and completed two thirds of their treatment-related goals (Pohl, 1997). Still, attrition during the early withdrawal phase of recovery was the primary limiting factor for up to 50% of the patients admitted (Pohl, 1996). Studies in the United States sponsored by the NADA have shown that treatment retention rates are universally too low, with the highest relapse/drop-out risk occurring within the first 3 months (DeLeon, 1991). Baseline data from the present study were consistent with this national trend. Improvements made in treatment program quality can lead to extended patient retention and eventually long-term outcomes (DeLeon, 1991). Our find-

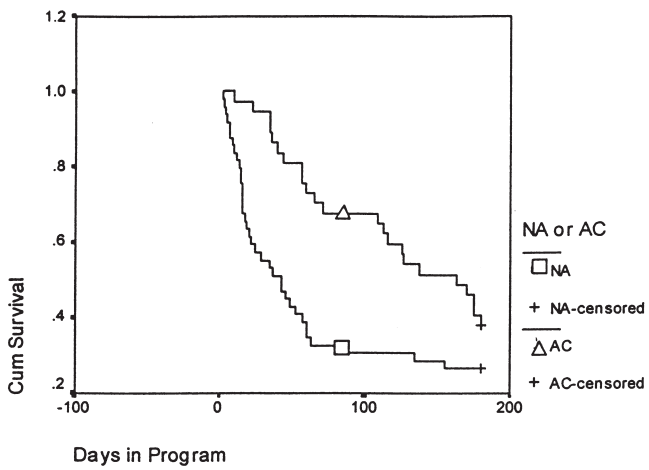

Fig. 2. Survival functions. Kaplan–Meier survival curves illustrate that patients who received acupuncture (AC) had a higher cumulative probability of remaining in treatment than patients who received no acupuncture (NA). Breslow analysis showed this difference to be significant ($p < .0021$).

Table 2
Advancement to treatment Phase II

Group	No. of patients	Days to Phase II
NA	11	97
AC	9	85

Note. NA = No acupuncture; AC = Acupuncture.

ings suggest that acupuncture enhances program quality and thereby induces clients to remain in treatment long enough to manifest its benefits.

The modest improvement seen in decreased arrests, drug-positive urinalysis tests, and advancement time, though they did not reach significance, may be regarded as trends which, along with improved attendance, will be worthy of more rigorous study. It is also plausible that acupuncture did not affect behaviors associated with drug use, commission of crimes, or desire/ability to progress in treatment. Perhaps patients continued to show up to experience relaxation or out of curiosity about a "new age" therapy. Patients may have returned because they enjoyed personal attention from a health-care provider and/or pleasurable sensations associated with acupuncture promoting production of endorphins (National Institutes of Health, 1997). Questions surrounding acupuncture's mechanism(s) of action are important and worthy of investigation, but their answers do not lie within the scope of this study.

The high percentage (51%) of patients in this study population who named methamphetamine as their primary drug of choice is noteworthy, because no criterion for inclusion was used which would select or exclude subjects by drug of choice. Nationwide, methamphetamine is estimated to be the drug of choice of 1–6% of patients presenting for addiction treatment, depending upon the area. In some western metropolitan areas, the percentage is much higher (National Institute on Drug Abuse, 1998). From this study, it would appear that, compared to patients addicted to alcohol and other drugs, patients withdrawing from methamphetamine were not helped by acupuncture, and that data from methamphetamine-addicted patients offset benefits seen in patients addicted to all other drugs. Regardless of speculation, a local tendency toward polyabuse (Clarke et al., 1996) and the low number of subjects rendered a single-drug study impractical in this setting. It is likely that our dividing an already small number into (roughly) fourths resulted in subgroups essentially too small for valid comparison. Accurate assessment of acupuncture for methamphetamine withdrawal will require a multicenter study. The participation of rural centers is recommended because methamphetamine abuse is more prevalent in rural areas, where its manufacture and sale are less subject to legal scrutiny (Oregon Governor's Council on Alcohol and Drug Abuse Programs, 1996).

This trial was a pilot study. The low number of subjects and the unavailability of a similar center to serve as a control site hampered the study's ability to yield definitive results. The use of historical controls was required because it was critical to avoid segregating clients of the criminal justice system into groups who received or did not receive acupuncture. In earlier studies, randomization of criminal justice clients within the same clinic contributed to a polarization of the patients into confederate "haves" and "have-nots," which interfered with the normal course of treatment (Konefal et al., 1994, 1995; also Konefal, personal communication). Furthermore, the quasi-experimental design limited the inferential power of standard statistical analysis. Nevertheless, the fact remains that proportionately more patients who received acupuncture stayed in treatment during the critical early months. Taken together, our findings support the further study of auricular acupuncture as an adjunct therapy in alcohol and drug treatment programs within the criminal justice system.

7. Conclusions

In a treatment program designed for chronic repeat offenders, a group of alcohol- and drug-addicted patients who were given auricular acupuncture exhibited higher program retention than did historical controls. In addition, acupuncture patients exhibited fewer new arrests, drug-positive urinalyses, or days needed to advance in treatment, but these trends did not reach significance.

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