

Counseling as an Intervention for the Cocaine-Abusing Methadone Maintenance Patient

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Abstract—Using archival data from Bay Area Addiction Research and Treatment (BAART), a methadone treatment provider, this study examined the efficacy of the clinical intervention of counseling on cocaine use by BAART patients. California State Assembly Bill 2071 mandated that patients at methadone clinics be required to undergo a minimum of 50 minutes of counseling per month. Records of 179 patients continuously active in treatment beginning 12 months prior to (i.e., the baseline) and two years after AB 2071's implementation were reviewed. These patients were also identified as cocaine abusers. A pretest-intervention-posttest design was employed, with the increased counseling mandated by AB 2071 as the intervention. Cocaine abusers' urinalysis results during the one-year baseline were compared to the time period following AB 2071's implementation. The independent variable was the amount of counseling received and the dependent variable was cocaine use. The prediction was that cocaine-abusing methadone maintenance patients would have fewer cocaine positive urine analyses following AB 2071's implementation than in the 12-month baseline period preceding AB 2071. Results supported the main hypothesis that cocaine-abusing patients would show better improvement following AB 2071. Additionally, the actual amount of time in counseling was shown to lead to greater improvement in treatment for cocaine abusers. An important secondary finding was that heroin use was also negatively correlated to time in counseling. There were no gender differences in the response to the counseling treatment.

Keywords—methadone, counseling, cocaine, heroin

As methadone became a widely used treatment for opiate addiction, a plethora of professional publications documented its efficacy (e.g., Newman & Peyser 1991). Methadone treatment is a widely studied treatment modality whose effectiveness has been demonstrated in a consistent, replicable manner (Gearing & Schweitzer 1974).

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Studies have used such parameters as reduction or cessation of illicit opiate abuse (Marsh 1998), decreased criminal activity (Rosenbach & Hunot 1995; Magura et al. 1993; Bell, Hall & Byth 1992; Anglin et al. 1989) and increased legitimate employment (Hubbard et al. 1997; Byrne & Wodak 1996; Knight et al. 1996; Tuma et al. 1993).

Since their onset, methadone maintenance programs (MMPs) have encountered various problems, with the most intractable of these being cocaine abuse. "Cocaine is endemic among patients in MMP's, seriously undermining a

fundamental goal of treatment, cessation of all illicit drug use, which is the basis for medical and psychosocial rehabilitation" (Avants et al. 1994:137).

In response to the cocaine problem, the federal government published a Treatment Improvement Protocol entitled "Assessment and Treatment of Cocaine-Abusing Methadone Maintenance Patients" (Kleber 1994), prepared by the Center for Substance Abuse Treatment (CSAT). It states in part that MMPs "must begin to deal with the increase in cocaine abuse among their patients by supplementing routine methadone with additional counseling focused on cocaine abuse and possibly with other pharmacologic interventions" (Kleber 1994). In 1997, the California State legislature passed Assembly Bill 2071, which stipulated that a minimum amount of counseling (50 minutes per month) be provided to patients in methadone treatment.

The present study assesses the specific impact of increased counseling on cocaine abuse in a methadone maintenance treatment setting. It consists of an analysis of archival data collected from Bay Area Addiction Research and Treatment (BAART), an organization that operates eleven methadone clinics in four California counties.

The literature on interventions for treating cocaine addiction in methadone maintenance settings falls into several categories, reflecting the research on various treatments that have been attempted with the cocaine-abusing methadone patient. These range from the pharmacologic to the psychotherapeutic, the cognitive/behavioral (incentives/vouchers), and alternative treatment modalities (i.e., acupuncture).

Pharmacologic approaches have attempted to answer the cocaine problem with medication, as methadone did for heroin. But no such medication has been found (Margolin, Avants & Kosten 1996). Avants and colleagues (1994) examined the use of antidepressants to reduce the sensitivity of dopamine autoreceptors, thereby reducing cocaine cravings and withdrawal symptoms. The treatment proved ineffective. Grabowski and colleagues (1995) conducted two studies on the impact of Fluoxetine on cocaine abuse. No differences were found between the control and treatment groups for both studies. Handelsmann and colleagues (1995) examined the efficacy of Amantadine; a double-blind placebo controlled study produced no significant results.

Behavioral incentives/voucher programs, in which patients receive incentives contingent upon remaining cocaine-abstinent, are considered promising and have shown positive results (Chutuape, Silverman & Stitzer 1999a; Silverman et al. 1996). Although many of these interventions have shown promise, they are often cost- and labor-intensive, and resources may not be universally available at methadone programs.

The literature on the psychotherapeutic approach demonstrates that psychotherapy can be an effective adjunct to treating cocaine abuse. Woody and colleagues (1995) studied the efficacy of individual psychotherapy for dually-diagnosed

methadone patients. They found that the participants in their study who received supportive-expressive psychotherapy exhibited significantly less cocaine use during the study than subjects who received drug counseling only.

Rosenblum and colleagues (1995) examined the effect on cocaine abuse of treatment intensity, in the form of cognitive-behavioral counseling sessions administered in combination with the pharmacological approach at an MMP. The counseling consisted of five individual and/or group sessions per week, and the investigators reported that "those patients attending the most sessions showed the greatest reduction in cocaine use at follow up" (Rosenblum et al. 1995: 151).

Rosenbaum and colleagues (1996) suggested that (a) cocaine-dependent subjects in most psychosocial trials appear to benefit from both psychopharmacological and psychotherapeutic treatment approaches, and (b) the non-specific effects of psychotherapy (e.g., support, education and empathy) may be effective in treating cocaine abuse. These results reflect findings from the field of psychotherapy regarding the nonspecific factors of treatment—e.g., the holding environment (therapy situation), the therapist as a therapeutic agent, and patients' greater capacity for change in the action phase of motivational change.

Studies reflecting the psychotherapeutic approach demonstrate that psychotherapy can be effective, but they do not conclude that there are differences in efficacy in psychotherapy over other approaches. Further, it has been difficult to establish the superiority of any particular type of counseling/therapy model. For most therapy models to be effective, patients must be highly motivated to participate and insight oriented. Many who participate in methadone maintenance and in early recovery do not possess such motivation and psychological mindedness.

The two goals of the present study are (1) to establish the efficacy of the clinical intervention of counseling on reduction of cocaine abuse, and (2) to assess the impact of the implementation of AB 2071 on cocaine abuse. This study can begin to establish whether required counseling is an effective intervention for cocaine addiction among methadone maintenance patients.

Consistent with those aims, the study tests the following hypotheses, discussed in greater detail in the methods section below:

- Narcotic replacement therapy patients (LAAM and methadone), who were cocaine abusers at baseline (prior to Assembly Bill 2071) will have decreased their use of cocaine following the implementation of AB 2071.
- There will be a negative correlation between amount of cocaine used and the amount of counseling a cocaine abuser receives.
- Patients who use less cocaine at baseline will use less cocaine than heavy cocaine abusers over the same period of time.

METHODS

This study analysed archival data from 11 clinics operated by Bay Area Addiction Research and Treatment (BAART) in San Francisco. The data were analysed to assess the impact of additional counseling on cocaine use. Cocaine abusers' urinalysis results during a one-year baseline were compared to a two-year period following the implementation of AB 2071. The standard BAART treatment model included daily methadone medication, regular substance abuse counseling sessions, and primary medical care. The independent variable in this study was the amount of counseling (1) pre AB 2071 and (2) post AB 2071. The dependent variable was cocaine use. Cocaine use was operationally defined as the presence of cocaine in the participant's urine drug screen. Drug screens were conducted for each patient monthly, as required by state regulation. The prediction was that methadone maintenance patients identified as cocaine abusers would have fewer cocaine-positive urine results following the implementation of AB 2071 than they did in the one-year baseline period preceding AB 2071.

A pretest-intervention-posttest design was employed using 179 selected subjects from BAART's clinic pool of over 15,000 potential subjects. In the group of selected subjects 102 were males and 77 females; all were current or former BAART methadone maintenance patients admitted since the organization's operations were computerized in the early 1990s. They ranged in age from 24 to 68 years of age (21 values were missing in the "age" field). The mean age for the records reviewed was 41.5. Of the subjects whose records were used in this study, 135 were dependent on public assistance, and 43 paid out of their own pocket for treatment services. One record did not have the subject's pay status.

Subject selection was based on the following criteria. Only those clients who were active in treatment beginning at least 12 months prior to the implementation of AB 2071 (July 1996), had remained continuously through two years following the implementation of AB 2071 (June 1999) and were identified as cocaine abusers were included in the sample. The subjects were defined as cocaine abusers if they had given six cocaine positive urine results from July of 1996 through June of 1997. Based on the randomness of the urinalysis, six urine results containing cocaine indicates a strong likelihood of relatively regular use of the drug. The total number of applicable records reviewed was 179 (based on the parameters of length of time in treatment and the definition of cocaine abuser).

Data Collection

The data were collected by BAART staff using the Johnson's software program (Creative Socio-Medics 1999), a computer application designed exclusively for methadone clinics. The Johnson's system is a relational database

using DBF format. The data were extracted from the Johnson's program databases and imported into Microsoft Access 97, which also utilizes DBF format.

As part of BAART's routine database management practices, methadone dosage data are posted and closed on a monthly basis. That is, once the data have been posted (i.e., entered into the Johnson's system) they are checked for accuracy and then moved from the active monthly database into a yearly database. As a result, the data collected for this study are archival in nature and they have been unaltered from their original time of collection.

Data from BAART's 11 clinics were merged into a single database using Microsoft Access. The data fields included: (1) the date admitted to treatment, (2) urinalysis results, counseling received, (3) discharge from treatment date if applicable, (4) gender; (5) Medi-Cal or private pay status, (6) date of birth, (7) the clinic in which the patient was enrolled, and (8) a unique identifier created to protect the patients' identities. The new database was exported from Access into an Excel file and then analysed using the Statistical Analysis System (SAS) software (SAS Institute, Inc. 2000).

Urine Collection and Results

California State regulation Title IX requires that narcotic treatment program patients be screened once per month for illicit drug use. The method of screening is by urinalysis. The specific dates for urine collection are randomized using Johnson's application. Urine samples are sent to the San Diego Reference Laboratory (SDRL); complying with state regulation, SDRL tests the urine for six classes of drugs: opiates, cocaine, methadone, methadone metabolite, amphetamine, and barbiturates. The urine samples undergo an enzyme immunoassay test. If the result in the initial test is positive for any class of the aforementioned drugs, a second test is conducted to yield more specific information. For example, if the first test result is positive for opiates, then a second test, called thin layer chromatography, is conducted to specify the type of opiate (e.g., morphine). The result of a urine sample positive for cocaine would show cocaine's metabolite, benzoylecgonine.

Results are faxed to the BAART clinics within several days and are entered manually into the Johnson's database by clinic staff. These urine results are used with a number of other measures to assess the patient's progress in treatment and to help the program's treatment team collaborate with the patient in treatment planning.

Intervention

The increase in counseling as defined by AB 2071 is this study's intervention. Prior to the passage of Assembly Bill 2071 in July of 1997, BAART required counselors to spend two sessions per month, of at least 15 minutes in length, with their patients. AB 2071 set the minimum amount of time at 50 minutes per patient per month. In response to AB 2071, BAART developed a counseling

services policy that set an even higher clinical standard. According to that policy, counseling is to be prescribed based on the individual clinical needs of each patient using an in-clinic assessment of the patient's level of functioning. The policy, written by senior level management and front-line clinicians, is intended as a guideline for the clinical team (primarily the program physician, clinic director, and primary counselor) to prescribe the amount and frequency of counseling a patient will receive. Patients who meet the policy's criteria for varying levels of impairment are prescribed more frequent counseling. Examples of indicators for level of impairment include continued illicit drug use, criminal activity, and existence of mental health issues. Policy guidelines dictate that, based on impairment, a patient can receive enhanced counseling services, at a prescribed average of 150 minutes per month, which loosely translates to three 50-minute sessions per month. Patients assessed as higher functioning are generally prescribed the state-mandated minimum of 50 minutes of counseling per month. Approximately 75% of BAART's patient population are prescribed enhanced (more than the state minimum) counseling services.

The content of counseling sessions varies greatly. There is some variation among BAART counselors in background, demographics, education, experience, and individual competencies, although all meet a standardized set of minimum requirements established by the organization. State regulations and BAART policy requires that specific content be covered in the individual counseling session. This is referred to as the treatment planning process, which begins when a new patient enters treatment. At this point the clinician conducts an Initial Clinical Assessment—a tool designed to gather information about the patient's history of functioning in a number of areas that include, but are not limited to: psychological health; physical health; drug use, abuse and dependence; employment; educational and vocational achievement; support system; and HIV and HCV risk and education. Subsequently, the clinician, along with the patient, develops an individualized treatment plan that addresses issues identified as problematic during the Initial Clinical Assessment. The treatment plan summarizes these issues in terms of goals and objectives that will constitute the focus of treatment and provide the major content for future therapy sessions between patient and primary counselor. Each goal on the treatment plan is discussed with the patient at least once per quarter. At the end of each quarter, treatment plan goals and objectives are reviewed, and a new treatment plan is developed. Each treatment plan indicates the type and frequency of counseling the patient will receive and is reviewed and approved by the program physician.

Hypotheses

The three research hypotheses tested here were based on patients who were identified as cocaine abusers in a

one-year baseline period prior to the implementation of Assembly Bill 2071:

1. Narcotic replacement therapy patients (LAAM and methadone) who were cocaine abusers at baseline (prior to Assembly Bill 2071) will have decreased their use of cocaine following the implementation of AB 2071 (as a result of the increased counseling intervention).
2. There will be a negative correlation between amount of cocaine used and the amount of counseling a cocaine abuser receives.
3. Patients who used less cocaine during baseline (i.e., pre-intervention) period will use less cocaine than heavy abusers over the post-intervention period of time.

After the data were compiled and a database was built, statistical analyses were used to test each of the three hypotheses.

To test hypothesis 1, data were analyzed using a paired *t* test, which compared urine results before and after AB 2071. Also, the data were analyzed using the Wilcoxon Matched Pairs Test for significance.

To test hypothesis 2, the Spearman's Rho was used to compare the relationship between counseling and urine results in the post-intervention period only.

To test hypothesis 3, patients were placed in two categories, in accordance with information from the database. A frequency distribution was conducted that included the mean number of cocaine-positive urine results for each patient, and the means were plotted. The median proportion of cocaine positives for patients who met the criteria was found to be 66% in the baseline period. Patients whose mean cocaine proportion was greater than the median were defined as "heavy-users." Their results were compared to their counterparts, who gave less than the median number of cocaine-positive urine results during the baseline period. Fisher's Exact Test was then used to analyze the difference between baseline heavy users and their nonheavy-using counterparts.

Missing data were removed using pair-wise deletion. That is, subjects who had the criterion of being in treatment on July 1, 1996 and June 30, 1999 but had no urinalysis or counseling data in the post period were removed from the data pool. Eleven subjects were removed due to missing data, leaving 168 subjects in the dataset for hypothesis 3.

RESULTS

The records reviewed were those of 102 males and 77 females, who ranged in age from 24 to 68 years; 21 values were missing in the "age" field. The mean age in the records reviewed was 41.5 years (SD = 8.0). One hundred and thirty-five patients were dependent on public assistance, while 43 paid out of pocket for treatment services (one value is missing). The mean number of urine results collected per patient ranged from one to 156.

TABLE 1
Drug Use Improvement Pre- and Post-Intervention

	Pre 2071	Post 2071	Change
Cocaine Mean (SD)	69.1 (17.8)	42.6 (29.8)	26.5 (28.9)
Heroin Mean (SD)	65.0 (23.7)	36.1 (29.0)	28.9 (29.5)

Four statistical tests were conducted to assess the normality of the data. Three of the four tests showed significant non-normality of data: Shapiro-Wilk ($p=0.1352$); Kolmogorov-Smirnov ($p=0.0240$); Cramer-von Mises, ($p=0.0250$); and Anderson-Darling ($p=0.0447$). Because three of four tests were significant, the null or normality assumptions were rejected and the data were analyzed using nonparametric statistical procedures.

Hypothesis 1 predicted that narcotic replacement therapy patients (LAAM and methadone) who were cocaine abusers at baseline (prior to Assembly Bill 2071) would have decreased their use of cocaine following the implementation of AB 2071. Accordingly, a cocaine abuser was defined as having had six or more cocaine-positive urinalysis drug screens prior to AB 2071. To test whether or not they had decreased their use of cocaine following implementation of AB 2071, proportions of positive cocaine urinalyses were compared using the Wilcoxon Matched Pairs Test for significance. The cocaine abusers' proportion of cocaine-positive drug screens in the baseline period were compared to their proportion of cocaine-positive drug screens in the two years following implementation of AB 2071.

For the 179 records reviewed, the mean proportion of drug screens positive for cocaine during the baseline period was 69%. Eleven patients who met the criterion of continuous treatment from July 1, 1996 through June 30, 1999 had no urinalysis or counseling data in the post period. This resulted in missing data and left 168 records reviewed. These participants were assessed in the two years following implementation of AB 2071. The mean proportion of cocaine-positive urine drug screens for these remaining records was 42.5%. The difference between the two means was 26.4%. The Wilcoxon signed rank tests showed $s=5362$, $p<.0001$, which is significant. Mean comparison results appear in Table 1.

Similar analyses were performed for heroin use with the same group of records reviewed. Pre-intervention heroin use, post-intervention heroin use, and difference of their means were 65%, 36% and 28%, respectively. A Wilcoxon Signed rank test was significant ($s = 5660$ $p<.0001$). See Table 1 for mean comparison results.

In terms of overall improvement, there was a decrease in overall positive urinalysis tests for cocaine (chi-square value 6.84, $df=7$; $p=.4460$) but no significant difference in improvement between clinics. (Two clinics were removed as these clinics contributed 1 and 4, respectively, to the

sample.) Similar analyses performed for heroin yielded a chi-square value of 11.36 ($df=7$), $p=.1237$. Again, there was no statistical significance. Moreover, there was no significant difference between counties in terms of improvement for cocaine use (chi-square 4.86, $df=3$; $p=.1820$) and heroin use (chi-square = 5.46, $df=3$; $p=.1410$). Neither of these scores were statistically significant.

Spearman's Rho was used to test hypothesis 2; the relationship between counseling and urine results in the post-intervention period only. Counseling was assessed using two measures: (a) number of sessions, and (b) total time spent in counseling (measured in units, with one unit being equal to a ten-minute interval). A correlation of the proportion of cocaine-positive urine drug screens and number of counseling sessions using the Spearman Correlation yielded $r = -.17$, $p = .109$, which is not statistically significant. There was a significant relationship between cocaine positive urine drug screens in post AB 2071 and number of units (see Table 2). That is, the more therapy patients received, the less positive cocaine results were given ($r = -.22$, $p = .0431$). This result supports hypothesis 2. Furthermore, there were significant relationships between heroin positive urine drug screens and number of sessions as well as number of units. Again, the more therapy patients received, the less positive heroin results were given.

According to hypothesis 3, patients who use less cocaine at baseline were expected to use less cocaine than heavy cocaine abusers over the same period of time. To test this hypothesis, patients were separated into two categories, in accordance with the data, and Fisher's Exact Test was used to analyze the difference between baseline heavy users and their nonheavy-using counterparts. Given the data available, the total sample was 168.

Heavy users and nonheavy users were further divided into two groups: those who improved (as defined by having a smaller proportion of cocaine-positive urine drug screens from pre- to post-AB 2071) and those who did not improve. Fisher's Exact Two-tailed test compared improvers and nonimprovers and found that the proportion of cocaine-positive urine drug screens was not significantly different between the improvers and the nonimprovers ($p = .0960$).

DISCUSSION

This study is a beginning effort to establishing that counseling is an effective intervention for cocaine addiction

TABLE 2
Drug Use Improvement and Counseling

Substance	Total # of Sessions	Total # of Units
Cocaine	-.17	-.22*
Heroin	-.21*	-.26*

among methadone maintenance patients. Patients identified as cocaine abusers significantly reduced their proportion of cocaine use with increased counseling. This significant reduction in cocaine use averaged more than 25%, as indicated by a decrease in cocaine-positive urinalysis results among the records reviewed. In fact, many patients stopped using cocaine altogether, as indicated by an absence of cocaine-positive drug screens in the post-implementation phase. The data suggest that the more time a patient spent in face-to-face counseling, the better the outcome. Similar results were found for the same group with regard to heroin use. Further, there seemed to be no difference from clinic to clinic or county to county with regard to improvement, suggesting that counseling was universally beneficial. The two aims of the present study were achieved: (1) the efficacy of the clinical intervention of counseling (which is sufficiently cost-effective to be carried out in most methadone programs) was established; and (2) the impact of the implementation of AB 2071 on cocaine abuse was assessed.

As predicted, there was a relationship between the amount of counseling a participant received and the amount of reduction in cocaine use. This relationship appeared consistently when the number of sessions was correlated to cocaine use and when the amount of time spent in counseling was correlated to cocaine use.

In comparing the number of therapy sessions received by those who improved to the number of sessions for those who did not, it was determined that those who improved received more therapy sessions than those who did not improve. When the same two groups were compared in terms of amount of time spent in therapy, it was determined that those who improved spent more time in counseling sessions than those who did not improve. Similar findings occurred for heroin abuse.

In order to determine whether patients who used less at baseline would use less cocaine than heavy cocaine abusers over the same period of time, heavy users and nonheavy users were further divided into two groups: those who improved and those who did not improve on using cocaine (as measured by cocaine-positive urine results). Among those who improved, there was not a significant difference in improvement in cocaine-positive urine results between heavy users and nonheavy users.

Explanations for Findings

The most plausible explanation for the reduction in cocaine use was participation in counseling. This finding is

consistent with the predictions made in the hypotheses and with the literature on counseling intervention (Rosenbaum et al. 1996; McLellan et al. 1993), which have indicated that counseling could be effective in reducing cocaine use. It follows that if counseling impacted drug use patterns, perhaps more counseling was related to better treatment outcomes. This was indicated in the current study and also follows previous studies about counseling and cocaine use. Further, it was shown that cocaine use was proportionally reduced as the amount of counseling increased. This supports the assertion that with counseling as an intervention for cocaine abuse "more is better."

One alternate explanation is that length of time in treatment is negatively correlated to reduction in overall drug use. That is, the more time a patient spends in treatment, the less s/he will use illicit drugs. Because the records reviewed in the present study were for patients who remained in treatment for at least three years, it is possible that even without additional counseling these patients would have improved as a group and would have reduced their illicit drug use.

It was predicted that heavy users had a more significant drug abuse problem, would be less amenable to treatment, and would therefore benefit less from counseling than their not so heavy-using counterparts. This was a finding of Silverman and colleagues (1996), whose study determined that vouchers were more successful with those with less severe cocaine abuse histories than with heavy users. However, this was not shown in the present study, as the difference between heavy users and nonheavy users in terms of improvement in cocaine-positive urine results was not statistically significant.

One explanation for this may be that there was not a large enough difference in amount of cocaine used between the heavy users and nonheavy users. In retrospect, the manner in which the groups were operationally defined had limitations. In this study, subjects with more than six cocaine-positive urinalyses in the year before the implementation of AB2071 were to be compared with those who had less than six positive urinalyses during the baseline period. There were no data on patients with less than six positive tests because patient records were not considered eligible for inclusion in the present study. Therefore, eligible subjects were then divided into two groups based on the median number of cocaine-positive drug screens for all who were eligible to participate in the study. Heavy

users were defined as those who had more than the median of cocaine positives in the baseline, and nonheavy users were defined as those who had less than the median. An analysis comparing the two groups yielded no statistically significant difference.

Even though this result was not found to be significant, it can nonetheless be considered a positive finding. Both the heavy users and nonheavy users benefited equally from the counseling intervention.

The present study draws upon and advances previous research that has shown counseling to be an effective adjunct to methadone treatment. The prevailing thinking over the

years has been that methadone maintenance is effective for opiate abuse and is not effective in reducing the use/abuse of other drugs. In fact, this study empirically shows that additional counseling is effective treatment for cocaine addiction among methadone maintenance patients. The utilization of empirically supported practices, such as increased counseling, can benefit both patients in treatment and the programs that struggle with the difficult clinical issue of cocaine dependency. This research contributes to the understanding of the treatment of cocaine abuse in methadone treatment settings.

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