Published in final edited form as:

J Subst Use. 2007 January 1; 12(1): 27–38. doi:10.1080/14659890600823826.

Drug treatment utilization before, during and after pregnancy

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Abstract

This study retrospectively explored drug treatment utilization before, during and after pregnancy for all identified substance-using women delivering at a county hospital over a 4-year period ($n=431$). Drug treatment data were linked to hospital data to analyse treatment utilization. Fifty-three per cent received treatment the year before, during, or within the year after delivery, with a significantly higher proportion receiving treatment during and after pregnancy. There were significant increases in methadone and residential treatment services during pregnancy. Women spent significantly more time in treatment after delivery compared with before or during pregnancy. However, 47% of these women did not receive drug treatment. These findings support current literature suggesting that pregnancy presents an opportunity to engage women in treatment. However, there is a need to decrease the institutional, legal, and funding barriers that exist between health care and drug treatment providers. Utilizing available data to track perinatal substance use and treatment utilization are important to plan for adequate availability of treatment services for this population.

Keywords

Substance use; pregnancy; drug treatment

Introduction

Illicit drug use among pregnant and parenting women has presented a major public health concern because of the health risks and consequences for both mother and child, and because of the additional challenges faced by drug treatment providers in serving this population.

Estimates of drug or alcohol abuse among pregnant women have ranged from 4% in national self-report surveys (National Household Survey on Drug Abuse, 2001) to 14% of deliveries in local studies using toxicology screens (Chasnoff, Landress, & Barrett, 1990; Vega, Kolody, Hwang, & Noble, 1993). A recent study of 8527 infant meconium samples found 9.5% positive for cocaine, 2.3% for opiates, and 2% for marijuana (Lester, El Sohly, Wright, Smeriglio, Verter, & Bauer, 2001). In one prenatal clinic setting, 38% of women were

identified as having a psychiatric and/or substance use problem by screening questionnaires (Kelly, Zatzick, & Anders, 2001).

The prevalence of substance use among pregnant women led to the development of drug treatment programs for pregnant and parenting women. At the national level, in 1993, a 10% set-aside for perinatal services was created as part of the block grant to states for substance abuse treatment (California Department of Alcohol and Drug Programs, 2000a). In California, an Office of Perinatal Substance Abuse was formed in 1990 to provide guidance and direction for perinatal drug treatment efforts, and currently oversees 249 perinatal drug treatment programs, serving approximately 12,000 pregnant and parenting women (California Department of Alcohol and Drug Programs, 2000b). These efforts to increase access were supported by a growing body of research suggesting that drug treatment for women is effective in reducing drug use (Eisen, Keyser-Smith, Dampeer, & Sambrano, 2000), improving psychosocial factors (Wexler, Cuadrado, & Stevens, 1998), and improving birth outcomes (Center for Substance Abuse Treatment, 2001).

However, barriers to treatment for pregnant and parenting women remain. A survey of 294 programs in five USA cities found that 18% of outpatient and 30% of residential/detoxification programs did not accept pregnant women, and that 30% of outpatient and 45% of residential/detoxification programs did not accept pregnant women if on Medicaid (Breitbart, Chavkin, & Wise, 1994). Barriers to treatment have included lack of transportation, lack of child care, and fear of legal problems (Klein & Zahnd, 1997), as well as the stigma of using drugs during pregnancy and the lack of family support to engage in treatment (National Center on Addiction and Substance Abuse, 1996). A national review estimated that in 1989, only 11.9% of pregnant substance-using women received drug treatment (National Center on Addiction and Substance Abuse, 1996). Drug treatment providers may feel inadequate in addressing pregnancy related health issues and often lack knowledge in how to medically manage women (Lester, Andreozzi, & Appiah, 2004). In addition, physicians may lack knowledge of or confidence in treatment services leading to less collaboration with treatment programs (Lester et al., 2004). The separate funding mechanisms for health care and drug treatment may also limit access to treatment services (Howell, Heiser, & Harrington, 1999).

While pregnancy may increase barriers to treatment for many women, it has also been suggested that pregnancy motivates women to seek treatment because of concerns about the health of their fetus (Grella, 1999), their own health (Gehshan, 1995), or fear of losing custody of their child (Howell & Chasnoff, 1999). Pregnancy also creates an opportunity for health care providers to identify women with drug use problems and offer referrals to drug treatment. However, a recent study noted that, of clients presenting to drug treatment programs being interviewed, only 45% thought their physician was aware of their substance use (Saitz, Mulvey, Plough, & Samet, 1997). Another study analysed hospital protocols for evaluating substance use during pregnancy (Zellman, Fair, Hoube, & Wong, 2002). Out of 806 hospitals solicited, only 71 actual protocols were sent for review. Overall, the protocols lacked sufficient guidelines for obstetric and neonatal management, lacked description of reasons for screening, and failed to describe adequately whether consent was required. Policies about who gets assessed and who gets screened for drug use has been a consistent concern because of potential biases (Birchfield, Scully, & Handler, 1995), and because of the relationship between drug use and criminal or child protective policies that may influence the providers' willingness to identify drug and alcohol use in the pregnant woman (Chavkin, 1990).

In recent years federal, state, and local agencies have launched initiatives designed to increase access to drug abuse treatment for pregnant women, and studies have documented

both the benefits and barriers to treatment in this population. However, few studies have investigated actual treatment utilization among women that includes the time before, during, and after pregnancy. The current study identified a cohort of women who used illicit drugs during pregnancy, and collected key information about these women from hospital and drug treatment datasets. The study objectives were to identify differences between drug-using pregnant women who do or do not receive treatment, and to identify when women were more likely to be in drug treatment around pregnancy.

Method

Overview

This is a descriptive study, utilizing county hospital records to identify a sample of 431 mother–infant dyads where there was evidence of substance use by the mother during pregnancy. We linked county drug abuse treatment data for each mother–infant dyad identified and extracted key data elements to create a single dataset. Variables in the combined mother–infant data file were coded and analysed. This study received approval from the University of California, San Francisco Committee on Human Research, and the San Francisco General Hospital Committee on Human Research.

San Francisco is an urban county with a population of approximately 780,000 people. The County hospital is the second largest delivery hospital. There are approximately 8200 births per year in the County; 10% African American, 30% White, 32% Asian, 23% Hispanic, and 5% other race/ethnicities (statistics compiled from vital statistics by San Francisco Department of Public Health staff). There are approximately 24,000 treatment admissions each year in the County drug treatment system (Guydish, Moore, Gleghorn, Davis, Sears, & Harcourt, 2000). Drug use during pregnancy is not reportable to any legal authority in San Francisco and, at birth, drug use, by itself, is not sufficient cause for reporting to child protective services.

Treatment system

The types of drug treatment services available for women and pregnant/parenting women in San Francisco consist of outpatient services, detoxification services (inpatient and outpatient), outpatient methadone maintenance, and residential treatment. There are residential treatment programs specifically designed for pregnant and parenting women, which consist of comprehensive services, but other residential programs are not specific for women. The recommended time in residential treatment is at least 6 months. Women on methadone were not eligible for residential treatment at the time of this study, however, that has changed. Many, but not all, of the other modalities have women-focused services, but are not comprehensive and few have links with health care providers. Recommended time in treatment for methadone detoxification services is 21 days and for outpatient services, 10 months.

Sample development

All births during a 4-year period (1 July 1995 to 30 June 1999) at a county hospital were screened for drug diagnostic codes for mothers and infants. The International Classification of Diseases, 9th edition, ICD-9 (Practice Management Information Corporation, 1997) codes and sub-codes for alcohol dependence, drug dependence, and non-dependent abuse of drugs in the mother at hospital discharge were used to identify the mothers. Codes that identified either exposure to drugs via the placenta (but not prescribed during labor) or fetal alcohol syndrome were used to identify infants. We then compared maternal and infant coding. If either the mother or infant had a diagnostic code for drug/alcohol use, the dyad was included in the sample ($n=431$).

Data sources and data linking

The hospital dataset included discharge diagnostic codes indicative of drug abuse, dependence, or exposure, and sociodemographic variables. The social security number was used to match women who were identified as having used illicit drugs during pregnancy during the 4-year period to the county drug abuse treatment information system. Drug abuse treatment records were reviewed from 1 July 1994 to 30 June 2000 to include treatment before and after delivery. Women who did not have a social security number were matched by name, ethnicity, and date of birth. The final dataset included all women with drug diagnostic codes and newborns with drug exposure diagnostic codes at delivery over a 4-year period and their drug treatment records.

Coding of variables

Health insurance coverage was coded as Medicaid vs. other and marital status was coded as single vs. other. In order to analyse drug treatment utilization before, during, and after pregnancy, an approximated pregnancy date was calculated by subtracting 280 days from the date of birth, since gestational age was not available in the dataset. This may have under or over estimated the length of the pregnancy for some women. Infant birth weight was analysed as a continuous and categorical variable. Low birth weight was defined as 1500–2499 g and very low birth weight was defined as <1500 g.

Drug categories were created based on the diagnostic codes. Diagnostic codes are based on maternal self-report of drug use, positive toxicology screens during pregnancy, and/or a positive toxicology screen in the newborn. Codes for a single drug were assigned if the mother had that diagnostic code and the infant did not, or vice versa (e.g. mother-cocaine, infant-none). If the mother and infant had different drug codes, a code for poly drug use was assigned (e.g. mother-cocaine, infant-narcotic). The numbers of women identified by diagnostic code for other drugs of abuse (e.g. amphetamines, marijuana, and alcohol) were too small to include as separate groups in the analyses so were grouped to create an “other” category. The criteria for urine toxicology screening in this institution included no prenatal care, premature birth with poor prenatal care, teen with poor prenatal care, maternal history of drug use, parental history of incarceration, history of sexually transmitted disease, history of prostitution, history of family violence, psychiatric history, intrauterine growth retardation, abruptio placentae, bizarre behavior, or infant withdrawal symptoms. Although the mother may refuse toxicology testing for her, testing of the infant does not require consent. If the mother self-reported drug use, even if the infant was not tested, she would have a diagnostic code for drug use.

Categories were created for drug treatment modalities. For women who received drug treatment in only one modality, the modality codes were as follows: outpatient drug free (which included admissions for outpatient, drop-in, and day treatment services), outpatient methadone maintenance, residential treatment, or detoxification (which included both residential and outpatient settings). For women in multiple modalities (e.g. detoxification to outpatient or outpatient to residential) during one time period around pregnancy, a “multi” modality code was created. Time in treatment was coded as a continuous variable and a categorical variable (<1 month, 1–3 months, and >3 months).

Analysis plan

The demographic differences among women who were and were not involved in drug abuse treatment were assessed utilizing a normally distributed test statistic with a *z*-score for comparison of proportions in dichotomous variables and *t*-tests for comparing continuous variables (Statacorp, 2003). To assess when women were most likely to enter treatment and what type of treatment was most often received, we compared the proportions of women

receiving treatment, treatment type (modality), and time in treatment before versus during pregnancy and during pregnancy versus after delivery. Due to the large numbers of women not in treatment at any two of the three time periods, a standard repeated measures test, such as a pair-wise *t*-test or McNemar's test would have resulted in the loss of a substantial amount of data. To incorporate all obtained data in our comparisons of the time periods, we used a generalized linear model and a generalized estimating equation to correct for the dependence in the data via Proc GENMOD in SAS v 8.2 (SAS Institute Inc., 2004).

Results

Overall sample characteristics

A total of 5940 live births occurred during this 4-year period in the county hospital: 5509 not having drug diagnostic codes and 431 drug-exposed dyads (7% of all births). Comparisons of the demographic variables between non-exposed and exposed births are presented in Table I. Mothers in the drug-exposed group were significantly more likely to be White (25% vs. 8%, $p<0.01$) or African-American (59% vs. 9%, $p<0.01$) compared with mothers of non-exposed births, and less likely to be Hispanic (10% vs. 58%, $p<0.01$). There was no significant difference between the two groups for Asians and women of other ethnicities. Women in the drug-exposed group were also significantly more likely to be single (87% vs. 55%, $p<0.01$) and older than the mothers in the non-exposed group (29 years vs. 26 years, $t=-9.3$, $p<0.01$). In the drug-exposed group (not included in the Table), cocaine was the only drug identified in 65% of the births, narcotics the only drug in 6%, and poly drug use in 11%. Other drugs (e.g. amphetamines, alcohol, hallucinogens) were identified in 18% of births.

The drug-exposed infants were significantly smaller at birth (2.8 kg vs. 3.3 kg, $t=15.5$, $p<0.01$) and had a significantly higher proportion of low birth weight infants compared with the non-drug exposed group (25% vs. 6%, $p<0.01$). There were also a significantly higher proportion of infants discharged to foster care at birth in the drug-exposed group compared with the non-drug exposed group (36% vs. 0.9%, $p<0.01$). Although it is not clear how many of these newborns were returned to their mothers once they were in treatment, it may reflect the continued concern that these infants are at high risk for abuse or neglect.

An analysis of birth weight by type of drug among substance exposed births showed that cocaine accounted for 79% of very low birth weight infants (<1500 g) and 69% of low birth weight infants (1500–2500 g). There was no significant difference in mean birth weight between cocaine and polydrug use, or cocaine and narcotic use, but there was a significant difference in mean birth weight between cocaine (mean 2.7 kg, SD 0.68) and other drug use (mean 3 kg, SD 0.63, $t\text{-test}=-3.67$, $p<0.01$). Although birth weight differences may be influenced by other factors, e.g. nicotine, those data were not available for this analysis.

Comparison of women who did and did not receive treatment

A total of 230 (53%) drug-using women received drug treatment at some point before, during or after pregnancy, while 201 women (47%) did not receive treatment at any point around pregnancy (see Table II). Women who received drug treatment were significantly older (30 years vs. 28 years, $t=-3.9$, $p<0.01$), and more likely to have Medicaid health insurance (94% vs. 83%, $p<0.01$). There were no significant differences in ethnicity or marital status between women who did or did not receive treatment. There were also no significant differences in type of drug identified between the two groups. Although the infants born to women who had received treatment at some point around pregnancy were significantly smaller at birth than were infants born to women not in treatment at any time (2.7 kg vs. 2.9 kg, $t=2.4$, $p=0.02$), there was no significant difference in the proportion of

low birth weight and very low birth weight infants. In further analysis (not in table), there was no difference in infant birth weight for women who had received drug treatment before their pregnancy (mean 2.8 kg, SD 0.73) vs. not (mean 2.8 kg, SD 0.66, $t=0.2$, $p=0.87$) or during pregnancy (mean 2.8 kg, SD 0.07) vs. not (mean 2.8 kg, SD 0.63, $t=-0.7$, $p=0.95$).

Treatment entry before, during and after pregnancy

Twenty-two per cent of women who were diagnosed with drug diagnostic codes at delivery had received drug treatment in the year before their pregnancy (Table III). During pregnancy, 31% received treatment and 44% received treatment in the year following delivery. The increase in the proportion of women receiving treatment during pregnancy compared with before pregnancy was significant [$\chi^2(1)=14.11$, $p<0.01$]. The increase in the proportion of women receiving treatment after delivery compared with during pregnancy was also significant [$\chi^2(1)=27.51$, $p<0.01$]. Although the majority of women in any given time period were not in drug treatment, there was a definite trend towards increased treatment utilization during and after pregnancy.

Patterns of treatment utilization

Treatment utilization was assessed in two ways:

- comparing modalities of treatment used before, during, and/or after pregnancy;
- comparing time in treatment before, during and after pregnancy.

Table III describes the drug treatment modalities used during the different time periods around pregnancy. In the year before pregnancy, outpatient (29%) and detoxification (24%) services were the most frequently used modalities. During pregnancy, outpatient methadone maintenance (42%) and multiple modalities (21%) were most frequent. In the year following delivery, women were in outpatient (31%), multiple modalities (25%), and outpatient methadone maintenance (21%).

During pregnancy, there was a significant decrease in outpatient ($p=0.02$) and detoxification services ($p=0.02$) compared with before pregnancy, while methadone maintenance ($p<0.01$) and residential treatment ($p=0.02$) services significantly increased. After delivery, there was a significantly increased use of outpatient services ($p<0.01$) compared with during pregnancy, while methadone maintenance ($p<0.01$) decreased, and detoxification and residential services were unchanged. Women who were treated in multiple modalities during any given time period often moved from detoxification services into a more permanent modality, e.g. outpatient. However, many moved from one modality to another, which may reflect the difficulty in maintaining women in treatment or matching women to the most appropriate treatment modality.

A higher proportion of women received treatment in methadone programs than were identified as using opiates. There is not a clear explanation for this finding. Women may change their primary drug to cocaine from heroin because of perceived less risk, thereby being classified as cocaine users, but identifying heroin as their primary drug of choice when being assessed by treatment providers. It may also reflect a misclassification of drug use via ICD9 codes (i.e. heroin/methadone use not reported by mother or not found in toxicology testing). This finding needs to be further evaluated.

Time in treatment comparisons are described in Table III. The mean number of days in treatment before pregnancy was 95 days (SD=121.2), during pregnancy the mean was 101 days (SD=89), and after delivery the mean was 162 days (SD=132). There was not a significant difference in time in treatment during pregnancy compared with before pregnancy [$\chi^2(1)=0.76$, $p=0.38$]. However, there was a significant increase in time in

treatment after delivery compared with during pregnancy [$\chi^2(1)=27.3, p<0.01$]. A further breakdown of time in treatment (not in table) revealed a decrease in the proportion of women who remained in drug treatment for less than 1 month during pregnancy (30%) and after delivery (23%) compared with before pregnancy (47%); perhaps paralleling the decrease in the proportion of women who were in detoxification services. Similarly, there was an increase in the proportion of women who remained in treatment for greater than 3 months during (45%) and after pregnancy (58%) compared with before pregnancy (31%).

Although there were no significant differences in the type of drug identified at birth between women who did or did not receive treatment, there were differences around pregnancy. Thirty-seven per cent of women who were diagnosed with poly drug use received treatment before pregnancy, but 74% received treatment during pregnancy and 71% after delivery. Only 24% of women diagnosed with narcotic use were in treatment before pregnancy, while 48% were in treatment during pregnancy and 52% after delivery. For women diagnosed with cocaine use at birth, 21% were in treatment before pregnancy, 23% during pregnancy, and 41% after delivery. Even the smaller numbers of women with other types of drugs identified at birth were more likely to be in treatment during pregnancy (23%) and after delivery (31%), compared with before pregnancy (16%).

Discussion

The results of this study provide additional support for the importance of pregnancy as a time to engage women in drug treatment. Pregnancy did appear to be a motivator in this sample, since women were significantly more likely to engage in drug treatment during pregnancy and/or after delivery compared with the year before pregnancy, consistent with findings from other studies (Gehshan, 1995; Grella, 1999). Their time in treatment increased during pregnancy and after delivery compared with before they were pregnant, a positive finding given that time in treatment has been associated with successful treatment outcomes (Simpson, 1981). Women received drug treatment in a variety of settings, reflecting both the availability of treatment slots and types of programs for the different drugs of abuse.

The findings from this study suggest the need for continued efforts to identify pregnant substance-using women and engage them in treatment. Although 58% of women in this study had received drug treatment before, during, and/or after delivery, 42% of drug-involved women never entered drug treatment at any point around pregnancy. Our findings also support previous literature, which shows that cocaine is often the most prevalent illicit drug used during pregnancy (Brindis, Berkowitz, & Clayson, 1997; Center for Substance Abuse Treatment, 2001) and represented the least likely group to enter drug treatment. The treatment of cocaine addiction in pregnant and parenting women needs to be further evaluated.

One of the problems of working with pregnant and parenting women who use illicit substances has been the lack of understanding and information by both health care and drug treatment providers of the different systems of care. Some of the differences in these systems include: who is the client, services provided whether or not the woman admits to a problem, whether to continue services if a woman is non-compliant, and which outcomes measure success (Puentes, 1993). Some of these differences may lead to conflicts between health care and treatment providers instead of encouraging collaboration.

Methods to improve this relationship might include enhanced health care provider training in identifying and referring pregnant women for drug treatment, and the development of stronger collaborations between drug treatment providers and health care providers. Health care providers can be trained to provide brief interventions that may encourage or support a

woman in seeking drug treatment (Samet, Rollnick, & Barnes, 1996). Drug treatment providers could benefit from having closer ties with health care providers so that their comfort level in working with pregnant women is enhanced and women can be assured of having their needs met. Drug treatment providers for pregnant and parenting women have been encouraged to offer comprehensive services, which include medical care, and support for obtaining and seeking that care (Mitchell, 1993). Although a recent review article identified a concern that specialized programs for pregnant women may focus too much on the pregnancy and not enough on meeting the overall comprehensive needs of women in treatment; the balance between the two issues can be achieved with appropriate efforts on both sides (Uziel-Miller & Lyons, 2000). Barriers to collaboration, e.g. funding streams, need to be evaluated and solutions implemented in order to limit institutional barriers to treatment.

Limitations

This study analysed births at a county hospital and drug treatment provided by the county system and, therefore, may not generalize to other populations and settings. Women might have accessed drug treatment through private agencies that do not report to the county drug treatment system, thereby underestimating the number of women who received drug treatment. Although the overwhelming majority of women were on Medicaid at delivery, their health insurance coverage may have limited their access to treatment, both before pregnancy and after delivery. This study was unable to analyse barriers for these women that may have limited their opportunities for engaging in drug treatment. Given research that has shown the effectiveness of drug treatment for women, especially if engaged in women-sensitive comprehensive services (Marsh, D'Aunno, & Smith, 2000; National Evaluation Data Services, 2001), more research is needed to identify both internal barriers for women and external system barriers, which discourage or inhibit drug treatment utilization.

Another limitation is the possibility that women were misclassified as not having used illicit drugs during pregnancy, thereby underestimating the number of substance-using women. Drug diagnostic codes are dependent on the health care provider identifying drug use as a problem. This relies on self-report by the mother, who may under-report her use, or drug testing, which may be biased in its application. One study found that only 43% of pregnant women engaged in drug treatment had symptoms documented in the medical record, 18% with diagnoses recorded, and treatment was noted in only 23% (Kelly et al., 2001). The misclassification of women who used illicit substances during pregnancy may also have led to an underestimate of the effect of treatment. However, the County hospital in San Francisco has been addressing the management of substance-using women since the 1970s, serving as a local "expert" in dealing with substance use during pregnancy, hopefully, decreasing the potential for misclassification.

Conclusions

Despite these limitations, the findings of this study greatly enhance the ability of community leaders to plan for the needs of this population. The ability to track drug use in pregnant women through the usual treatment reporting systems is often limited. Utilizing hospital data provides an opportunity to track trends and identify areas of need. Although the depth of information available through these sources is limited, the information can help community leaders plan treatment services, identify areas of greatest need, and serve as a way to evaluate the effectiveness of community level interventions. In addition, an assessment of community policies within health care and drug treatment programs is needed in order to develop additional strategies to encourage drug treatment entry and retention, not only for pregnant and postpartum women, but also for women of childbearing age.

Acknowledgments

Funding for this project was provided by the Center for Substance Abuse Treatment (Task Order #282-98-0026), by the National Institute on Drug Abuse (R01 DA 12221) and by the National Institute on Drug Abuse, San Francisco Treatment Research Center (Center Grant P50 DA09253). We would also like to thank the members of the Writers Task Force, San Francisco Community Substance Abuse Services, and San Francisco General Hospital for their support.

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Table I

Comparison of non-substance using women and substance using women and infants at delivery, 1 July 1995 to 30 June 1999.

Variable	Non-substance use (n=5509)	Substance use (n=431)	t or z score
	n (%)	n (%)	
Ethnicity			
White	434 (8)	108 (25)	-5.1 *
African American	511 (9)	253 (59)	-14.7 *
Hispanic	3184 (58)	43 (10)	6.3 *
Asian	1234 (22)	12 (3)	1.6
Other	146 (3)	15 (3)	-0.2
Single	3026 (55)	375 (87)	-12.8 *
Medicaid	5036 (91)	383 (88)	1.8
Low birth weight	341 (6)	108 (25)	-5.6 *
Very low birth weight	66 (1)	19 (5)	-0.9
Foster care discharge at birth	48 (0.9)	155 (36)	-4.8 *
	Mean (SD)	Mean (SD)	
Maternal age	26.5 years (6.30)	29.4 years (6.21)	-9.3 *
Birth weight	3.3 kg (0.60)	2.8 kg (0.69)	15.5 *

*
p<0.01.

Table II

Comparison of substance use in women and infants in drug treatment versus not in treatment

Variable	<u>In treatment (n=230)</u>	<u>Not in treatment (n=201)</u>	<i>t</i> or <i>z</i> score
	<i>n</i> (%)	<i>n</i> (%)	
Ethnicity			
White	63 (27)	45 (23)	0.5
African American	134 (58)	119 (59)	-0.2
Hispanic	18 (8)	25 (12)	-0.4
Asian	8 (4)	4 (2)	0.2
Other	7 (3)	8 (4)	-0.1
Single	194 (84)	181 (90)	-1.7
Medicaid	216 (94)	167 (83)	-3.6
Low birth weight	58 (25)	50 (25)	0
Very low birth weight	17 (7)	2 (1)	0.3
Foster care discharge at birth	92 (40)	63 (31)	1.1
Type of drug identified			
Cocaine	148 (64)	132 (66)	-0.4
Narcotic	15 (7)	10 (5)	0.2
Poly drug	40 (17)	9 (4)	0.99
Other	27 (12)	50 (25)	-1.4
	Mean (SD)	Mean (SD)	
Maternal age	30.5 years (5.33)	28.2 years (6.94)	-3.9
Birth weight	2.7 kg (0.73)	2.9 kg (0.60)	2.4 **

*
 $p < 0.01$.**
 $p < 0.05$.

Table III
Comparison of treatment modality and time in treatment before, during, and after pregnancy

Variable	1 year before pregnancy <i>n</i> (%)	During pregnancy <i>n</i> (%)	1 year after delivery <i>n</i> (%)	Before vs. during χ^2	During vs. after χ^2
Drug/alcohol diagnosis	94 (22%)	131 (31%)	187 (44%)	14.11 [*]	27.51 [*]
Modality					
Outpatient	27 (29%)	14 (11%)	58 (31%)	5.45 [*]	30.25 [*]
Multiple	15 (16%)	27 (21%)	47 (25%)	5.83 ^{**}	6.33 ^{**}
Detoxification	23 (24%)	11 (8%)	11 (6%)	5.14 ^{**}	0.00
Methadone	18 (19%)	55 (42%)	39 (21%)	34.11 [*]	9.0 [*]
Residential	11 (12%)	24 (18%)	32 (17%)	5.12 ^{**}	2.0
Time in treatment	Mean (SD) 95.2 days (121.21)	Mean (SD) 101.3 days (89.03)	Mean (SD) 162.2 days (132.02)	0.76	27.30 [*]

^{*}
 $p < 0.01$.

^{**}
 $p < 0.05$.