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Gestational Age at Enrollment and Continued Substance Use Among Pregnant Women in Drug Treatment

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Abstract

Substance use during pregnancy is associated with poor obstetrical and neonatal outcomes. Although intervention for substance use including alcohol improves pregnancy outcomes, a substantial number of women continue to use drugs or consume alcohol during treatment. To determine whether gestational age at entry into treatment (specifically first trimester enrollment) was associated with lower risk of continued substance use, we analyzed the North Carolina Treatment Outcomes and Program Performance System, an administrative database of drug treatment clinics, between 2000 and 2004. There were 847 pregnant women using substances who met our inclusion criteria. Demographic and other risk factor data were collected. We conducted logistic regression and a Generalized Estimating Equation analysis. Gestational age at enrollment was not associated with continued substance use (odds ratio [OR] = 0.88; 95% confidence interval [CI] = 0.51, 1.51). Women who had child care provided, were less likely to continue substance use (OR = 0.64; 95% CI = 0.48, 0.84), whereas those referred from the criminal justice system were more likely to continue (OR = 1.53; 95% CI = 1.01, 2.30). Although earlier gestational age at enrollment in treatment does not predict greater abstinence at any time point, this data does suggest that the provision of childcare may improve treatment success.

Keywords

Pregnancy; Generalized Estimating Equation Analysis; drug; alcohol treatment

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INTRODUCTION

Substance use during pregnancy is an important and complex public health concern. Approximately 4.6% of women use illicit drugs and 16.5% use alcohol during pregnancy.[1] However, the prevalence of substance use in pregnancy varies widely depending on the populations studied from 1.6% among U.S. military recruits and their spouses[2] to 23% in Alabama public prenatal clinics.[3] Overall, it is estimated that 7 million women of reproductive age meet criteria for drug dependence or abuse[4] and at least 14 million meet criteria for alcohol dependence or abuse[5] during their lifetime.

Women who use substances during pregnancy are more likely to experience adverse obstetrical and perinatal outcomes than women in the general population.[6–10] Use of alcohol and illicit drugs in pregnancy has been associated with preterm delivery and low birth weight infants.[11] Cocaine, in particular, has been associated with placental abruption, preterm rupture of membranes, low birth weight newborns, and neonatal abstinence syndrome,[7,9–13] whereas alcohol is associated with Fetal Alcohol Syndrome, the most common cause of mental retardation in the United States.[14,15] Compared to the general population, women using substances are also at higher risk of becoming infected with human immunodeficiency virus, being victims of abuse and crime,[16] and delivering substance-exposed newborns. Women who continue substance use after childbirth have more difficulties with parenting, a more chaotic home and family life,[17] and can be more likely to neglect or abuse their children[16] than women who stop using substances before or after childbirth.

Drug treatment in pregnancy has been shown to improve participation in prenatal care and reduce the maternal and fetal complications associated with illicit drug use.[18–20] Given the infrastructure and financial resources for prenatal care, pregnancy has been considered a “window of opportunity” for drug treatment intervention.[21] Although pregnant women face more barriers to treatment enrollment than other drug using populations,[22,23] participation in drug treatment has been shown to reduce the maternal and fetal complications associated with illicit drug use, especially preterm delivery and low birth weight.[24,25] Even in the absence of prenatal care, women enrolled in drug treatment programs during pregnancy have fewer preterm deliveries and greater birth weight infants.[26] However, enrollment in treatment does not guarantee abstinence. An evaluation of the Center for Substance Abuse Prevention’s Pregnant and Post-partum Women and their Infants Demonstration Program showed that although more than 70% of women in the program participated “at least adequately” in prenatal care, only approximately 40% of the participating women had negative drug tests at delivery.[27] Compared with the growth of treatment services available to pregnant women, there is a relative paucity of research investigating modifiable influences on continued drug use.

Both the American College of Obstetricians and Gynecologists[28] and the American Academy of Pediatrics[29] support screening for illicit drug use in pregnancy. In guiding practitioner referral for treatment, however, evidence on the comparative efficacy of different treatment modalities is meager. Furthermore, there is no evidence of the appropriate timing of screening and clinic enrollment. It might be assumed that entry into treatment in the first trimester (rather than later in pregnancy) improves outcomes but no study to date investigates whether gestational age on enrollment predicts continued drug use. The purpose of this study is to determine whether entry into drug treatment during the first trimester of pregnancy reduces the likelihood of continued drug use at subsequent visits.

MATERIALS AND METHODS

This study is an analysis of data from the North Carolina Treatment Outcome and Program Performance System (NC-TOPPS), the system by which the North Carolina Division of Mental Health, Developmental Disabilities and Substance Abuse Services measures outcome and performance for substance abuse and mental health clients. It is the chief method of collecting the information necessary for quality improvement and local management of the state's substance abuse and mental health clinics. NC-TOPPS began in 1997 and it currently captures data from 62 clinics serving 20 different subpopulations throughout the state. Since July 1999, specialized treatment services for pregnant and parenting women have been included in the data set.

The NC-TOPPS data is organized and administered by the Institute for Community-Based Research at the National Development and Research Institute, Inc. (NDRI). The data consist of an intake instrument administered at enrollment and an update instrument administered at 3-, 6-, and 12-month intervals until the individual is discharged from the treatment program. The questionnaires are administered by clinic staff an updates are either administered in person or over the telephone.[30,31] The authors analyzed a retrospective cohort formed from within the maternal-pregnant population. Pregnant women enrolled in any of the specialized maternal-pregnant programs between July 2000 and July 2004 who had used drugs in the past 30 days and for whom data for continued drug use at follow up were included.

We sought to identify risk factors associated with continued drug use among pregnant women enrolled in drug treatment programs. In particular, we sought to address whether enrollment in the program during the first trimester was associated with a decrease in the odds of continued drug use measured at 3, 6, or 12 months.

The outcome of the study was continued drug use, which was captured from the update assessments. A client was considered to be continuing to use drugs if she reported continued drug or alcohol use or if her urine toxicology was positive. Although self-report is not a reliable tool for prevalence data due to the unreliability of negative responses, a positive response is considered sensitive for drug use and has been correlated with toxicology.[6,7] The main exposure was gestational age at the time of enrollment. This was a binary variable with 12 completed weeks as the cut point. This information was captured from the intake assessments. Demographic data was captured from the intake instrument as well.

There was fairly large attrition for the 6- and 12-month assessments. Therefore, to take advantage of all data, we first fit three separate logistic regression models, one for each of the follow-up assessments (3, 6, and 12 months). Each model was right censored to capture all potential follow up. Effect measure modification was assessed through stratified analysis and Breslow-Day test of homogeneity of the odds ratio (OR). There were no meaningful interactions between any covariate and gestational age. Confounding was assessed via both an analysis of a Directed Acyclic Graph[32] as well as by using a backward elimination strategy with a change-in-estimate of greater than 0.1 considered substantial. For each model, the unadjusted (crude) OR was compared with the fully adjusted OR, which included all of the covariates and was considered the gold standard. Age and race were not found to be confounders by either Directed Acyclic Graph analysis or through backward elimination and were therefore excluded from the final three models.

There are limitations to fitting three separate logistic models. Using each time interval as an observation would avoid this problem but would violate the assumption of independent observations because time interval would be clustered within each woman. To account for the repeated observations in our data, a Generalized Estimating Equations (GEE) model was constructed. GEE was originally described[33,34] as a means of extending the generalized

linear model to allow for correlated observations. Repeated measures on the same individual over time are, by definition, correlated. GEE has emerged as a strong model choice for analysis of data sets with such repeated measurements. An advantage to the GEE model over traditional repeated measures analyses is that it is able to use a varying number of observations for each participant in the study. Therefore, whether a woman has one, two, or three follow-up assessments, all information about her is included in the analysis. Our use of the GEE allowed us to analyze the entire data set in a single model. Effect measure modification and confounding were analyzed as with the logistic model. The final GEE model had the same final variables as the three logistic models. Given the large attrition in the study population, a sensitivity analysis was performed for all models. This analysis assumed that those lost to follow up continued to use drugs.

Results are reported as OR with 95% confidence intervals (CI). The statistical software STATA version 8.2 (STATA Corporation, College Station, TX) was used for all analysis. The study was conducted with the written permission of NDRI, who administer the NC-TOPPS data, as well as with the approval of the University of North Carolina School of Public Health Institutional Review Board.

RESULTS

Between July 2000 and July 2004, 3,423 clients underwent intake assessment. Of these, 847 met the inclusion criteria and of these 606 had follow up at 3 months, 374 at 6 months, and 204 at 12 months. The majority of those excluded were excluded because they were not pregnant at the time of enrollment. Continued drug use was the main outcome (Table 1). While 100% of the women were using drugs on enrollment, only 41% were using at 3 months. This proportion changed only negligibly to 39% at 6 months and 36% at 12 months. The main exposure was gestational trimester at the time of enrollment: 223 (26.3%) individuals were enrolled in the 12th week of gestation or less and 624 (73.7%) were enrolled after 13 weeks. Overall, the groups were similar with respect to all of the covariates except for health insurance status. Individuals enrolled in the first trimester had a greater odd of having private payor health insurance at all three assessments for 3, 6, 12 months: OR = 2.75 (95% CI = 1.72, 4.39), OR =2.39 (95% CI = 1.36, 4.21), OR = 2.71 (95% CI = 1.11, 6.60). There was no difference in terms of the variables measured between the women lost after 3 months and those still in treatment at 6 and 12 months (data not shown).

The most common drug of choice was cocaine followed by marijuana. Approximately 14% of clients were referred to drug treatment from the criminal justice system, and fewer than 10% underwent detoxification treatment. Fifty-four percent received childcare as part of treatment. Although all pregnant women qualify for Medicaid, approximately 15% of the population reported having no insurance. In addition, approximately 25% reported not having received prenatal care (or a referral for prenatal care). Half of the cohort was African American and approximately 40% was white. Less than 50% of the cohort had a high school diploma (Table 2).

Age, race, and enrollment in prenatal care were not found to be confounders and were excluded from the final model. The odds of continued drug use at either 3, 6, or 12 months did not vary with the gestational trimester of enrollment (Table 3). Compared with cocaine use, the odds of continued drug use were higher among those using either alcohol or marijuana and lower for those who used heroin or other drugs. At the 3- and 6-month outcomes, women who received childcare in the treatment facility had an approximate 50–50 chance of continued drug use. Women referred into drug treatment from the criminal justice system had increased odds of continued drug use at all assessments, although the confidence interval included the null value for both the 3- and 12-month assessments.

Women who had detoxification treatment also had increased odds of continued drug use at all assessments, although the CI includes the null value at the 6-month time point (Table 3).

There is an increased loss to follow-up seen in the cohort with each subsequent time point. It is plausible that these women are missing because they are continuing to use drugs. To evaluate this potential bias, a sensitivity analysis was performed. We assumed that all individuals missing for follow up were continuing to use drugs. Adjusting for the same covariates as in the final model, the results of the sensitivity analysis are listed in Table 4. The odds of continued drug use by gestational age of treatment enrollment display a time-varying pattern in the sensitivity analysis. First trimester enrollment was associated with an increased odds of continued drug use at 3 months (OR = 1.77 [95% CI = 1.27, 2.48]), a null effect at 6 months (OR = 0.93 [95% CI = 0.65, 1.34]), and decreased odds at 12 months (OR = 0.49 [95% CI = 0.33, 0.73]). The interpretation of the covariates in the model does not change. Both detoxification treatment and a criminal justice referral were associated with an increase in the odds of continued drug use, whereas provision of childcare as part of treatment coordination was associated with decreased odds.

The results of the GEE analysis are similar to those of the logistic models and are shown in Table 5. After adjusting for the covariates in the model, the odds ratio of continued drug use at any time point for individuals who enrolled in the first trimester was 0.88 (95% CI = 0.51, 1.51). Individuals who used alcohol or marijuana were more likely to continue to use drugs compared with those who used cocaine, whereas those who used heroin or any other drugs were less likely. Individuals who reported receipt of childcare had a decreased odds of continued drug use (OR = 0.64 [95% CI = 0.48, 0.84]), as did individuals with health insurance and those with a high school diploma or greater education (however, these two estimates included the null value). Individuals referred from the criminal justice system were more likely to continue drug use (1.53 OR = [95% CI = 1.01, 2.30]), as were those who underwent detoxification treatment (OR = 5.52 [95% CI = 3.16, 9.65]).

DISCUSSION

The odds of continued drug use did not appear to be related to gestational trimester on enrollment. We had speculated that earlier screening and referral to achieve earlier enrollment in drug treatment would translate into a greater proportion of women achieving abstinence at earlier assessments. However, first trimester enrollment was not associated with decreased odds of continued drug use. The results of the sensitivity analysis indicate the possibility that a differential attrition of clients at each of the assessments contributed to the null effect of gestational trimester on the likelihood of continued drug use. Both the crude and the adjusted sensitivity analysis show an increase in the odds of continued use at 3 months, no effect at 6 months, and a decrease in continued use at 12 months (Table 4). Additional analyses of those missing follow up compared with the rest of the cohort, however, did not establish any clear patterns.

The negative finding is unlikely to be the result of the sample size. Given an alpha level of 0.05 and a beta of 0.20, our sample size was powered to detect at least a 32% reduction in continued drug use. Overall, approximately 60% of pregnant women using drugs achieved abstinence, a proportion that remained constant throughout the study period (Table 1). This proportion is similar to that reported in other series of pregnant women in drug treatment.[27] Clearly, the act of accessing treatment is itself beneficial and should be considered as a component of treatment success. Furthermore, early prenatal care has other benefits aside from the generation of drug treatment referrals.

Although gestational trimester was not associated with the odds of continued drug use, detoxification treatment, a criminal justice referral, and receiving childcare were associated with the odds of continued drug use. Women who received childcare had 0.64 times the odds of continued drug use compared with women who did not. This is an interesting observation. There is evidence that women using substances experience a tension between treatment enrollment and caring for a new infant or other children.[11,35] Furthermore, there is some evidence that women who are dependent on alcohol and are in specialized clinics, which include childcare services, have fewer social problems and demonstrate a greater reduction in alcohol use.[36] A similar benefit, however, has not been observed with illicit substances.[4,37] The crack cocaine "epidemic" of the early 1990s led to a greater societal awareness of the unique situation posed by perinatal drug use. Consequently, more money was allocated to both research and treatment for this special population.[38] The past decade has seen a growth in both women and family-centered treatment clinics that provide, among other things, childcare. Our observation of the beneficial effect of childcare on substance use abstinence points to the possible benefit of such clinics.

Women referred into treatment by the criminal justice system were 50% more likely to continue drug use compared with women who were either self or medically referred. There has been debate as to whether drug use (in particular, illicit drug use) in pregnancy is best approached from a public health or a criminal justice perspective. In our cohort, there were criminal justice referrals for treatment from every subgroup of drug of choice. Our analysis does not support a benefit of criminal justice referrals. If anything, such referrals are less likely to lead to abstinence when compared with other referrals. Aside from court-ordered drinking and driving remedial programs, the evidence for mandated treatment is equivocal at best.[39,40] Others have shown that legal interventions may discourage women from seeking prenatal care or drug treatment.[42]

The only treatment modality we were able to evaluate in the model was detoxification treatment. Although all drug subgroups were represented, there were more cocaine users and fewer marijuana users in the detoxification group. Women who were referred for detoxification as part of their treatment had over five times the odds of continued drug use compared with women who did not. The imprecision of this estimate, illustrated by the wide confidence intervals, reflects the fact that only a small proportion of the cohort was referred for detoxification. This result should not be simply understood as a condemnation of detoxification as a treatment modality. Detoxification in this cohort was performed only in the inpatient setting. We were unable to assess the combination of detoxification with other psychosocial intervention, which has been shown to be more effective than detoxification alone.[43] It is also important to remember that women for whom such a treatment was offered may have had medical co-morbidities or other differences from the rest of the cohort population that were not captured in our variable selection.

It must also be noted that the population in this sample is not representative of the general population in North Carolina or of substance users in general. This population has a lower education than the general population, with only 43% receiving a high school diploma compared to the average of 78.1% in the state.[44] There is also a greater representation of African American women in this sample. A possible cause of this problem may be that women with greater resources may have an easier time hiding their drug addiction and may be less likely to be screened for drug use by their doctors.[38] Some may also be able to afford treatment from non-publicly funded providers not captured in this data set. The societal stigma associated with being a pregnant drug user is worse than the general stigma of being a woman drug user.[38] This leads most women try to hide their drug addiction from their physician and society in general.

Our analysis was constrained by the limitations imposed by a secondary data analysis. For example, we were unable to include and control for certain covariates, such as parity, because such information was not captured in the original data. It would also have been interesting to have more data on treatment matching approached and treatment components attended. However, the heterogeneity of referral options coupled with a large amount of both missing and inconsistent values in the original instruments limited our variable construction. Although some researchers have used graded systems to describe the "intensity" of drug treatment,[17] our data lent itself only to the most subjective of scoring classification. The only treatment modality that we felt could be strongly captured with certainty in the original data was detoxification treatment.

An infant born to a mother who tests positive for drugs has a longer and more expensive hospital course than one who does not[27,46,47] and identifying risk factors for continued use at the time of delivery might aid not just in reducing the medical (obstetrical and perinatal) sequelae of such exposure, but also in reducing the cost as well. We were, however, unable to study neonatal drug status as an endpoint. Part of the use agreement for the NC-TOPPS data was that it be depersonalized. The identification numbers were unique to the clinics and we were, therefore, unable to match them with birth certificate data. Although the risks for labor and delivery cannot be addressed in this study, by focusing on 3-, 6-, and 12-month assessments the contours of the natural history of drug use in pregnancy are illuminated and overall patterns of abstinence versus continued drug use and their associated risk factors shown.

CONCLUSIONS

Pregnant women who enroll in drug treatment in the first trimester are no less likely to continue using drugs than women who enroll later in gestation. Based on our data, it does not appear that there is a key time of capture for pregnant drug-using women to maximize future abstinence as an outcome. However, enrollment in treatment was in and of itself beneficial because the proportion of drug use decreased from 100% to 40%.

Substance use by pregnant women elicits strong emotions in the public imagination. The presence of both the growth of family-centered treatment clinics and the trend toward reframing perinatal substance use as a criminal justice issue as opposed to public health issue illustrates the wide range of response to this problem. All the more reason that various modalities of treatment (and punishment) should be evaluated with outcomes oriented evidence.

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TABLE 1

Proportion of Clients Continuing Substance Use at 3, 6, and 12 Months

	3 Months N (%)	6 Months N (%)	12 Months N (%)
Not using	355 (56.8%)	228 (61.0%)	131 (64.2%)
Using	251 (41.4%)	146 (39.0%)	73 (35.8%)
Total	606 (100%)	374 (100%)	204 (100%)

TABLE 2

Characteristics of the Client Population (N = 847)

Variable	Total Frequency (%)
Gestational age	
≥ 12 weeks	232 (23.6)
> 12 weeks	624 (73.7)
Drug of choice	
ETOH	127 (15.0)
Marijuana	195 (23.0)
Cocaine	321 (37.9)
Heroin	92 (10.9)
Other[a]	112 (13.2)
Childcare	
Received	459 (54.2)
Not received	388 (45.8)
Criminal Justice	
Mandated	121 (14.3)
Not mandated	726 (85.7)
Detoxification	
Detoxification	63 (7.4)
No detoxification	784 (92.6)
Prenatal care	
Received	615 (72.6)
Not received	232 (27.4)
Health insurance	
Insurance	717 (84.7)
No insurance	130 (15.3)
Race	
White	336 (39.7)
Black	422 (49.8)
Other	70 (8.3)
Missing	19 (2.2)
Education	
High school diploma	364 (43.0)
No diploma	483 (57.0)
Maternal age	
Range	14 to 44
Mean	27.8
SD	6.5

ETOH = alcohol; SD = standard deviation.

[a]Other includes amphetamines, methamphetamines, hallucinogens, and prescription medicines such as oxycontin.

TABLE 3

Risk Factors for Continued Substance Use: Results of Logistic Regression Analysis

Variable	3 Months OR (95% CI)	6 Months OR (95% CI)	12 Months OR (95% CI)
Unadjusted OR			
Trimester[a]	0.98 (0.65, 1.46)	0.83 (0.51, 1.35)	1.13 (0.63, 2.03)
Adjusted Model			
Trimester[a]	0.86 (0.56, 1.33)	0.80 (0.47, 1.32)	1.05 (0.54, 2.03)
Drug of choice			
ETOH	1.63 (0.97, 2.73)	1.39 (0.74, 2.61)	1.80 (0.77, 4.20)
Marijuana	2.15 (1.38, 3.36)	1.05 (0.58, 1.89)	1.22 (0.52, 2.87)
Cocaine	1	1	1
Heroin	0.84 (0.47, 1.53)	0.94 (0.43, 2.07)	1.33 (0.38, 4.66)
Other	0.45 (0.25, 0.82)	0.44 (0.22, 0.87)	0.82 (0.29, 2.36)
Childcare	0.58 (0.41, 0.83)	0.52 (0.33, 0.83)	1.15 (0.29, 2.36)
Criminal justice referral	1.25 (0.76, 2.08)	2.09 (1.09, 4.01)	1.90 (0.78, 4.63)
Received detoxification	4.91 (2.49, 9.67)	3.12 (0.80, 12.16)	29.64 (3.50, 251.05)
Insurance[b]	0.84 (0.52, 1.36)	1.06 (0.59, 1.90)	0.60 (0.21, 1.73)
Education[c]	0.74 (0.53, 1.05)	0.73 (0.47, 1.14)	0.93 (0.50, 1.73)

ETOH = alcohol.

[a]Odds for women entering treatment less than 12 completed weeks gestation.

[b]Odds for women with any type of health insurance vs. no health insurance.

[c]Odds for women with at least a high school diploma or equivalent.

TABLE 4

Assuming All Those Lost to Follow Up Were Continuing Substance Use: Results of a Sensitivity Analysis of the Logistic Models

Variables	3 Months OR (95% CI)	6 Months OR (95% CI)	12 Months OR (95% CI)
Unadjusted OR			
Trimester[a]	1.74 (1.26, 2.40)	0.97 (0.69, 1.37)	0.52 (0.35, 0.76)
Adjusted Model			
Trimester[a]	1.77 (1.27, 2.48)	0.93 (0.65, 1.34)	0.49 (0.33, 0.73)
Drug of Choice			
ETOH	1.24 (0.81, 1.92)	1.09 (0.67, 1.78)	0.70 (0.40, 1.22)
Marijuana	1.46 (0.99, 2.14)	1.08 (0.70, 1.67)	0.88 (0.53, 1.48)
Cocaine	1	1	1
Heroin	0.89 (0.54, 1.42)	1.04 (0.59, 1.83)	1.15 (0.56, 2.37)
Other	0.57 (0.37, 0.89)	0.38 (0.24, 0.61)	0.72 (0.49, 1.08)
Childcare	0.58 (0.44, 0.78)	0.36 (0.25, 0.50)	0.73 (0.49, 1.08)
Criminal Justice Referral	1.44 (0.95, 2.20)	1.83 (1.10, 3.04)	1.74 (0.93, 3.26)
Received Detoxification	1.67 (0.96, 2.93)	1.63 (0.85, 3.11)	2.01 (0.83, 4.86)
Insurance[b]	0.64 (0.43, 0.95)	0.82 (0.53, 1.27)	1.48 (0.83, 2.63)
Education[c]	0.86 (0.64, 1.14)	0.75 (0.54, 1.03)	1.08 (0.74, 1.59)

ETOH = alcohol.

[a] Odds for women entering treatment less than 12 completed weeks gestation.

[b] Odds for women with any type of health insurance vs. no health insurance.

[c] Odds for women with at least a high school diploma or equivalent.

TABLE 5

Risk Factors for Continued Substance Use: Results of Generalized Estimating Equation Analysis

Variable	OR (95% CI)
Unadjusted Odds ratio	
Trimester[a]	1.01 (0.75, 1.36)
Unadjusted OR	
Trimester	1.15 (0.71, 1.85)
Month*Trimester*	0.98 (0.92, 1.04)
Adjusted model	
Trimester	0.88 (0.51, 1.51)
Drug of Choice	
ETOH	1.54 (1.02, 2.30)
Marijuana	1.59 (1.10, 2.80)
Cocaine	1
Heroin	0.89 (0.54, 1.46)
Other	0.49 (0.31, 0.79)
Childcare	0.64 (0.48, 0.84)
Criminal Justice Referral	1.53 (1.01, 2.30)
Received Detoxification	5.52 (3.16, 9.65)
Insurance[b]	0.85 0.58, 1.25)
Education[c]	0.79 (0.60, 1.04)
Month	0.97 (0.93, 1.01)
Month*Trimester*	1.01 (0.94, 1.09)

[a]Odds for women entering treatmentatless than12completed weeks gestation.

[b]Odds for women with any type of health insurance vs. no health insurance.

[c]Odds for women with at least a high school diploma or equivalent. Interaction term between month and trimester.