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Comparison of Characteristics of Opioid-using Pregnant Women in Rural and Urban Settings

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Abstract

Historically, research on opioid use during pregnancy has occurred in urban settings and it is unclear how urban and rural populations compare. We examined socio-demographic and other variables in opioid-using pregnant women seeking treatment and screened for participation in a multi-site randomized controlled trial. Women screened in rural Burlington, VT (n=54) were compared to those screened in urban Baltimore, MD (n=305). Rural opioid-using pregnant women appear to have some characteristics associated with better treatment outcomes (e.g., less severe drug use, greater employment). However, they may face additional barriers in accessing treatment (e.g., greater distance from treatment clinic).

Keywords

Pregnancy; opioids; rural; urban

Introduction

The problem of opioid use and dependence during pregnancy has been a studied for nearly 40 years. Early scientific reports came from urban areas, such as New York (e.g., 1) and Philadelphia (e.g., 2), and documented the many physical, psychological, and socioeconomic issues of pregnant women dependent on heroin. These and other studies also demonstrated that comprehensive care of opioid-dependent pregnant women including methadone maintenance had a positive impact on pregnancy outcomes, such as neonatal birth weight (e.g., 3,4). These promising data helped provide an empirical foundation for the development of comprehensive perinatal treatment guidelines (e.g., 5).

Despite advances in treatment, opioid use and dependence during pregnancy continues to be a significant public health problem. Data from the National Survey on Drug Use and Health (NSDUH) indicate that the rate of heroin use by pregnant women has increased somewhat over time and alarmingly, there has been a 33% increase in non-medical use of analgesics in this population in the past decade (6,7). These data underscore the continued significance of this problem.

Perhaps related to increases in non-medical use of analgesics, which have disproportionately affected rural and suburban settings (8,9), recent reports from rural states like Vermont and

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Kentucky have documented significant numbers of pregnant women seeking treatment for their opioid use (10,11). However, little is known about the characteristics of rural opioid-using pregnant women. It is also unclear how the characteristics of rural women compare to the perhaps more familiar profile of urban opioid-using pregnant women. Prior comparisons of substance use during pregnancy in rural and urban settings have typically focused on the prevalence of drug use in these two populations (e.g., 12). Little research has examined potential similarities and differences in their characteristics, especially characteristics shown to impact treatment and pregnancy outcomes.

The aim of the present study was to characterize socio-demographic, pregnancy, and drug use variables in rural opioid-using pregnant women and to compare them to urban opioid-using pregnant women. Particular attention was paid to characteristics known to influence treatment and pregnancy outcomes (e.g., level of dependence, pregnancy intendedness). Although the literature is increasingly mixed on whether living in a rural area plays a protective role in the development and maintenance of substance abuse problems (e.g., 13,14), it was hypothesized that characteristics of rural opioid-using pregnant women would suggest a less severe profile than their urban counterparts.

Method

Participants

Data were obtained from 359 opioid-using pregnant women screened for potential admission to the MOTHER (Maternal Opioid Treatment: Human Experimental Research) trial between July 2005 and October 2007. The multi-site MOTHER trial began in 2005 and is designed to examine the comparative safety and efficacy of methadone and buprenorphine in the treatment of opioid-dependence among pregnant women and their neonates (for more detail, see 15). Of the 359 women in the present study, 54 were from the rural site at the University of Vermont, Burlington, VT and 305 were from the urban site at the Johns Hopkins Bayview Medical Center, Baltimore, MD.

Sites

Rural site—The rural site was the University of Vermont Substance Abuse Treatment Center (SATC) located on the University Health Center campus in Burlington, VT (population 39,148). The SATC is a research-based treatment clinic where federally funded randomized clinical trials for the treatment of substance abuse, such as the MOTHER study, are conducted. Treatment varies as a function of the protocol, but participants typically receive intensive outpatient treatment that includes individual therapy with case management and incentives contingent on drug abstinence.

Urban site—The urban site was the Center for Addiction and Pregnancy (CAP) located on the Johns Hopkins Bayview Medical Center campus in Baltimore, MD (population 635,815). Care at CAP is comprehensive and includes addiction treatment (group and individual therapy and psychoeducation), methadone maintenance for opioid-dependence, case management, obstetrical care, psychiatric evaluation and treatment, general medical management, and on-site child care and pediatric care. Maternal treatment commences with a seven-night stay on an assisted living unit and is followed by intensive outpatient treatment. CAP has an active and productive research program and the medical charts of all patients entering CAP who sign the HIPAA research screening authorization form are reviewed to determine whether they meet initial eligibility criteria for participation in ongoing research studies.

Screening Assessment

At each site, study staff conducted a brief (15 min.) interview with potential participants to complete the screening assessment. At the urban site, potential participants were not asked again about information already ascertained from the medical chart review. The screening assessment was developed specifically for the trial and assessed basic demographics, information about the current pregnancy, and information about current and past drug use that allowed study staff to assess each woman's status with regard to major trial inclusion and exclusion criteria. Demographic information collected included age, race, education level, marital status, employment status, involvement with the legal system and home address. Involvement with the legal system included women who reported currently being on probation, parole, or facing impending trial. Home addresses were entered into Mapquest (www.mapquest.com) to calculate how many miles each woman lived from her respective clinic. This data could not be calculated for 32 (10%) of the urban women because Mapquest could not locate the address given (n=25) or they were homeless (n=7). Information collected about the current pregnancy included estimated gestational age and the intendedness of the current pregnancy. Women who responded that they intended to become pregnant "sooner" or "now" were classified as having intended pregnancies, while those who responded, "later", "never", or "don't know/unsure" were classified as having unintended pregnancies (16). Drug use and treatment variables assessed included frequency of current opioid and cocaine use and the number of and type of prior treatment episodes.

Data Analyses

Data from women screened at the rural site (n=54) was compared to data from women screened at the urban site (n=305) using chi-square tests for dichotomous variables and t-tests for continuous variables. Statistical significance was based on $\alpha = .05$.

Results

Socio-demographic Variables

Significant differences were observed between rural and urban pregnant opioid-using women on four of the seven socio-demographic variables assessed (Table 1). First, rural women were significantly younger than urban women ($p < .001$) and second, a higher percentage of rural participants were White ($p < .001$). Third, a higher percentage of rural women were employed compared to urban women ($p < .001$). Fourth, rural participants lived significantly farther away from the treatment clinic compared to urban women ($p < .01$).

Current Pregnancy

With respect to the current pregnancy, two significant differences emerged (Table 1). First, rural women were screened significantly earlier in their pregnancy compared to urban women ($p < .01$). Second, twice as many rural women reported that they intended to be pregnant at this time compared to urban women ($p < .05$).

Drug Use and Drug Treatment History at Screening

Two significant differences were observed in regard to recent drug use (Table 1). First, with respect to current opioid use, a lower percentage of rural women reported current daily or almost daily opioid use compared to urban women ($p < .001$). Second, with respect to current cocaine use, a much lower percentage of rural women reported cocaine use in the past 30 days ($p< .001$). Significant differences were also observed between rural and urban women on two variables related to prior treatment history. First, a lower percentage of rural women reported prior substance abuse treatment ($p < .001$). Second, of those with prior treatment, a lower

percentage of rural women reported prior methadone treatment (< .001), although there were no differences between groups in the percentage reporting prior buprenorphine treatment.

Discussion

The existing literature on opioid use during pregnancy consists almost exclusively of research done in urban settings, but the present results indicate that opioid use during pregnancy is also a problem in rural areas. When the absolute numbers of women screened at the rural and urban sites in the present study are considered on a per capita basis, the rate of opioid-using women presenting for treatment was nearly three times higher at the rural relative to the urban site (138 vs. 48 women per 100,000 residents, respectively). This observation highlights the need to learn more about rural women using opioids during pregnancy and characteristics that may influence their treatment and pregnancy outcomes.

Two differences observed suggest that drug use by rural opioid-using pregnant women is less severe than that of urban women. First, fewer rural women reported regular opioid use; in general, a lower severity of baseline drug use at treatment intake has been shown to predict more favorable treatment outcome (17,18). Second, but more striking, rural opioid-using pregnant women reported substantially less cocaine use: 7 times fewer rural compared to urban women reported cocaine use in the past 30 days. Cocaine use by opioid-dependent patients has been reported to have a strong negative effect on treatment outcome (e.g., 19,20). Together, these data suggest that rural opioid-using pregnant women may present with less severe drug use compared to urban women.

Two other characteristics that differed significantly between rural and urban opioid-using pregnant women also suggest rural women may have better outcomes than urban women. First, rural women were 7 times more likely to be employed. Descriptive studies have shown that employment is associated with lower rates of drug use within groups of substance abuse treatment patients (see 21). Second, twice as many rural than urban women reported that the pregnancy was intended. Unintended pregnancies are associated with greater licit and illicit drug use (22,23) as well as increased risk of some poor birth outcomes, such as preterm delivery and infant low birth weight (16,24).

While rural women have a number of characteristics that suggest better overall treatment and pregnancy outcomes, these data also suggest they may face barriers to accessing treatment relative to urban women. For example, rural women lived about twice as far away from the treatment clinic as urban women. In addition, the lower percentage of rural women with prior methadone treatment may be illustrative of the more limited treatment options typically available in rural areas (25).

Overall, these data suggest several differences between rural and urban opioid-using pregnant women, but two limitations should be noted. First, data were collected on a limited number of variables. For example, the screening instrument asked about the frequency of opioid use, but not the type of opioid(s) use. Anecdotally, we observed that rural women were primarily prescription opiate abusers and urban women were primarily heroin abusers, which may have implications for the assessment and treatment of neonatal abstinence syndrome. A second limitation is that study participants may not be representative of rural opioid-using pregnant women. We are aware of only one other related report (11) that characterized pregnant women, the majority of whom were from rural areas of Kentucky, who were seeking treatment at an inpatient psychiatric unit for dependence on prescription opioids. The socio-demographic and pregnancy characteristics of their sample were quite consistent with those of rural Vermont women in the present study. However, fewer Kentucky women reported prior drug treatment, especially methadone treatment. These results raise additional important questions about

opioid and other drug use by rural pregnant women and suggest that further studies are warranted to further investigate this special population.

In summary, initial results suggest that rural pregnant opioid-using women may have a number of characteristics that are often associated with better treatment and pregnancy outcomes. However, they may face additional barriers to accessing treatment. This information may inform efforts to treat this special population.

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Table 1

Comparison of Rural versus Urban Participant Characteristics

	Rural (n = 54)	Urban (n = 305)	*p* value
Socio-demographics:			
Mean (± SEM) age (yrs)	24.2 ± 0.6	30.5 ± 0.3	<.001
% White	98	54	<.001
Mean (± SEM) education (yrs)	11.5 ± 0.2	11.1 ± 0.1	.054
% Married	10	8	.617
% Employed	22	3	<.001
% Involved with legal system	24	23	.834
Mean (± SEM) distance from treatment clinic (miles)	20.6 ± 3.0	11.3 ± 0.9[a]	< .01
Current Pregnancy:			
Mean (± SEM) estimated gestational age (weeks)	15.6 ± 1.1	18.5 ± 0.4	<.01
% With intended pregnancy	21	10	<.05
Drug Use and Treatment:			
% Daily/almost daily opioid use in past 30 days	89	98	<.001
% Using cocaine in past 30 days	12	69	<.001
% With prior drug treatment	81	99	<.001
Mean (±SEM) number of prior treatment episodes	2.5 ± 0.4	3.0 ± 0.1	.237
% With prior methadone treatment	39	97	<.001
% With prior buprenorphine treatment	35	48	.084

[a] Data from 32 women are missing because the address given could not be located (n=25) or they were homeless (n=7).