

OBSTETRICS

Prevalence of illicit drug use in pregnant women in a Wisconsin private practice setting

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OBJECTIVE: We sought to measure the prevalence of illicit drug use in our obstetric population, to identify the drugs being used, and to determine whether a modified version of the 4Ps Plus screening tool could serve as an initial screen.

STUDY DESIGN: In this prospective study, urine samples of 200 unselected patients presenting for initiation of prenatal care in a Wisconsin private practice were analyzed for evidence of the use of illicit drugs.

RESULTS: Of 200 patients, 26 (13%) had evidence of drugs of abuse in their urine samples. Marijuana (7%) and opioids (6.5%) were the most

commonly identified drugs. Adding 5 questions about drug or alcohol use to the obstetric intake questionnaire proved sensitive in identifying patients with high risks of having a positive drug screen.

CONCLUSION: The rate of drug use in our low-risk population was higher than expected and may reflect increasing rates of drug use across the United States. Enhanced screening should be performed to identify patients using illicit drugs in pregnancy to improve their care. Medical centers and communities may benefit from periodic testing of their community prevalence rates to aid in appropriate care planning.

Key words: drug screening, illicit drug use, pregnancy, prenatal care

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The use of illicit drugs is increasing in the United States.¹⁻³ The reported rate of drug use in obstetric populations varies from 2.8-19.2%, depending on the population studied, trimester of pregnancy tested, methodology used, drugs tested, and time period in which the study was conducted.⁴⁻¹⁰

According to the American Congress of Obstetricians and Gynecologists and the American Society of Addiction Medicine, urine drug screens are “an adjunct to detect or confirm suspected

EDITORS' ★ CHOICE

substance use, but should be performed only with the patient's consent and in compliance with state laws.¹¹ However, screening by selected questions, or a questionnaire, should be universally performed in all pregnancies.¹¹ Several screening tools exist. The 4Ps Plus is a 5-question screening tool reported by Chasnoff et al¹² in 2005 and validated in a multicenter study by Chasnoff et al¹³ in 2007.

The purposes of this study were to obtain substance abuse prevalence rates for our population of patients, to identify the drugs being used, and to evaluate a 5-question screening tool to guide further testing, using urine drug screens as our primary evaluation tool.

MATERIALS AND METHODS

We screened 200 women presenting to a single obstetrics clinic for the initiation of prenatal care from January through May 2013 for substance use. Patients are seen for prenatal care at this location by 6 obstetricians and 5 certified nurse-midwives. The number of participants in the study was a convenience sample based on estimates of the approximate

range of illicit drug use and funding constraints. The study was approved by our organizational human subjects committee/institutional review board (IRB).

At the first prenatal visit, as part of the normal intake interview, nurses gathered demographic information including age, gravidity, parity, gestational age, smoking history, and response to 5 questions about drug use using a modified version of the 4Ps Plus screening tool (Table 1). After obtaining a urine sample, we informed patients that the sample would be sent for a drug screen, but that the sample would be deidentified, guaranteeing their anonymity. A code linking the sample to the demographic information collected was applied to the container. Per IRB guidance, consent was not required because the providers guaranteed anonymity through deidentification of the patient. All patients were given written information about the study and drug use in pregnancy, and were urged to seek assistance with treatment and/or smoking cessation, if needed.

The urine samples were tested using the Profile-V Medtox scan Drugs of Abuse Test System (detailed description

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TABLE 1
Modified 4Ps survey

Parents: Have your parents ever had a problem with drugs or alcohol?
Partner: Has your partner ever had a problem with drugs or alcohol? (The partner was asked directly, if available.)
Past: Have you ever had a problem in the past with drugs or alcohol?
Present: Have you used any drugs or alcohol in the past month?
Smoking: Do you currently smoke cigarettes?

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is available at: www.medtox.com/Resources/Images/4525.pdf; Med-Tox Scientific, St. Paul, MN). Results of the urine drug screen were reported to the primary investigator (C.W.S.), who also accessed the deidentified obstetric intake information and the response to the modified 4Ps questionnaire. The primary point analysis was comparing the deidentified intake information of patients with positive drug screens with that of patients with negative screens. The data were normally distributed. Parametric tests including independent sample *t* test and χ^2 (Fisher exact test was used if we had a cell count <5 or 25%) to compare patients who tested negative with those who tested positive. Statistical

significance was defined as $P < .05$. Multiple logistic regression with binary logit model was used to assess the relationship between patients who tested positive and those who tested negative with the 4Ps variable and using backward methods to eliminate insignificant main predictor variables.

RESULTS

During the study period, 219 patients initiated prenatal care at our clinic site, 200 of whom were included in our study. When patients were not included in this study, it was primarily due to time constraints that prevented nurses from completing the necessary steps for inclusion, especially transport of the urine sample to the laboratory. One patient was adamant that her urine not be included in the screen; although under our IRB-approved protocol, patients were not required to grant permission for the sampling, we honored her request. Another patient was excluded because she was found not to be pregnant.

Of the 200 women included in our study, 26 (13%) tested positive on urine drug screen. **Table 2** provides the type and frequency distribution of the drugs detected. **Table 3** presents age, gravidity, and parity by drug screen result. Overall, the median age for the study population was 27 years (range, 16–43 years); median gravidity and parity were 2 (range, 1–9) and 1 (range, 0–7), respectively; and prenatal care was initiated at a median of 8 weeks (4.4–37.6 weeks).

Eight patients had >1 drug identified with all 6 of the patients using benzodiazepines also using other drugs. Age and gestational age were not statistically different, but parity was greater ($P < .05$).

They all responded positively to at least 1 of the 4Ps and/or smoking history.

Table 4 demonstrates the results of univariate and multivariate analysis, with a high rate of smoking in those who tested positive compared with those who tested negative (61.5% vs 18.9%, respectively; $P < .001$). The rate of partner history of drug use was significantly higher in women with positive drug screens than in those with negative screens (34.6% vs 9.8%, respectively; $P = .002$). The rate of parental history of drug use, too, was significantly higher in women who tested positive than in those who tested negative (53.9% vs 21.8%, respectively; $P < .001$). Regarding drug use in the past or present, those who tested positive had a much higher rate of present and past use of drugs (34.6% and 65.4%, respectively) compared with those who tested negative (4% and 9.8%, respectively; $P < .001$). Multiple logistic regression for the above factors showed that only past and present drug use were significant predictors of a positive drug screen result.

Finally, we grouped the 4Ps in a questionnaire format. In all, 76 patients (38%) answered “yes” to at least one of the 4Ps, 24 of whom tested positive (31.6%; $P < .001$). Sensitivity analysis showed that the modified 4Ps Plus questionnaire has high sensitivity (92.3%) and relatively lower specificity (70.1%). Positive and negative predictive values were 32% and 98%, respectively.

COMMENT

The rate of drug use in our population exceeded our expectations, based on previous studies in the literature. The best estimates came from 2 studies of patients of similar geographic and social-economic status: Matti and Caspersen⁴ reported a 3.9% prevalence rate in a rural population receiving care in southern Minnesota at the Mayo Clinic in 1993. A Wisconsin Department of Health and Family Services study⁵ conducted in 1996 through 1997 reported urinalyses positive for drug use in 3.1% of 384 pregnant women sampled across the state of Wisconsin. Other prevalence studies vary considerably in methodology, drugs tested, and year of

TABLE 2
Type and frequency of drugs detected

Drug	No. of patients tested positive
Marijuana	14
Opioids	
Heroin	5
Hydrocodone	2
Oxycodone	2
Methadone	2
Buprenorphine	1
Codeine	1
Benzodiazepines	6
Methamphetamines	3
Cocaine	1
Amphetamine	1

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