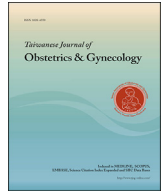




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Original Article

Maternal characteristics and pregnancy outcomes among illicit drug-using women in an urban setting

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ABSTRACT

Objective: To identify characteristics and pregnancy outcomes among pregnant illicit drug users living in an urban area, and to describe trends in drug use over an 8-year period.

Materials and methods: Data on pregnant women living in the Bangkok Metropolitan Region who delivered at our institution during 2008–2015 were studied. Women with drug use (n = 197) and women without drug use (n = 787) were compared in terms of maternal characteristics and pregnancy outcomes.

Results: The pregnant drug user rate markedly rose from 0.46% in 2008 to 1.28% in 2015. All pregnant drug users consumed amphetamine-type stimulants (ATS). The most important factor related to drug use was smoking (adjusted odds ratio [aOR] 41.03, 95% confidence interval [CI] 18.90–89.04). Other significant characteristics were teenage pregnancy (aOR 1.78, 95% CI 1.01–3.18), low level of education (aOR 4.97, 95% CI 1.18–20.90 for secondary school and aOR 5.61, 95% CI 1.28–24.49 for primary school or lower), and inadequate number of antenatal visits (aOR 2.20, 95% CI 1.16–4.17 for 1–3 visits and aOR 14.05, 95% CI 7.54–26.16 for no visit). Women of non-Thai ethnicity were less likely to use drugs (aOR 0.15, 95% CI 0.04–0.54). Pregnant drug users had a significantly higher risk of anemia (aOR 1.73, 95% CI 1.05–2.85), preterm delivery (aOR 2.35, 95% CI 1.29–4.29), low birth weight (aOR 2.26, 95% CI 1.23–4.17) and small for gestational age infants (aOR 3.19, 95% CI 1.39–7.33), but lower risk of cesarean section (aOR 0.43, 95% CI 0.21–0.86) than non-drug users.

Conclusion: Compared to urban pregnant women without drug use, women who consumed drugs were younger, had lower level of education, poorer self-care and poorer pregnancy outcomes. ATS was the single most commonly used drug.

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Introduction

Illicit drugs are drugs that are prohibited for non-medical use by international law [1]. These drugs include heroin and other opioids, amphetamine-type stimulants (ATS), marijuana and cocaine [1]. According to the World Drug Report 2016 [2], the global number of illicit drug users aged 15–64 years went up from 208 million people in 2006 to 247 million people in 2014 with a net increase of 18.8%. A remarkable increase in global illicit drug consumption and production is due mainly to rapid industrialization and population growth in developing countries [2–4].

An urban area is a human settlement typically consisting of a large population with social, cultural, economic and ethnic diversity. Urban inhabitants were reported to have higher prevalence rates of drug use than those living in rural environments [5,6]. Moreover, urban drug-using pregnant women were found to present with more severe drug use resulting in poorer pregnancy outcomes compared to rural ones [7]. Several reasons have been proposed to explain an increase of drug use among urban population. These include higher financial capacity and easier drug accessibility [8,9]. Other reasons are more peer pressure among urban adolescents, stressful urban lifestyle, and unhealthy family relationships [8,10].

Drug-using women of childbearing age were found to be at increased risk of unplanned pregnancy [7,11,12], which then increases the risk of prenatal drug exposure. One option to improve the pregnancy outcomes of these women, especially in urban ones

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who tend to have severe degree of drug use, is to identify their particular characteristics, so a proactive early detection and specialized treatment program could be directly applied to this specific group. Several authors reported characteristics of pregnant women living in urban areas who consumed illicit drugs [13–15]. However, these studies did not exclude women with a short-term stay who might not be regarded as actual urban inhabitants. In addition, results from previous reports showed the inconsistencies in findings associated with the teratogenic effects of some drug types including ATS and cocaine [16,17].

The aim of this study was to determine characteristics associated with illicit drug use during pregnancy and related pregnancy outcomes among urban pregnant women. Eight-year trends in prevalence and types of drug use were also evaluated.

Materials and methods

This retrospective matched cohort study included pregnant women who had lived in the Bangkok Metropolitan Region (BMR) for at least five years and delivered at our institution between January 1, 2008 and December 31, 2015. The cohort subjects were chosen in two steps. Firstly, women who reported use of illicit drug(s) during pregnancy with a positive urine drug screen were identified as study subjects. Then, each study subject was matched to four control women who had no record of drug use, according to parity and date of delivery. Exclusion criteria were multiple pregnancies, known medical diseases that may affect the outcomes of pregnancy (e.g. chronic hypertension, overt diabetes, renal disease, etc.), history of spontaneous preterm delivery, fetal chromosomal anomalies and incomplete medical records. The research protocol was reviewed and approved by the Vajira Institutional Review Board (approval number 51/2558).

Data on maternal characteristics and pregnancy outcomes were obtained from medical charts and the hospital's electronic database. Maternal characteristic features included age, ethnicity, level of education, marital status, occupation, parity, pre-pregnancy weight, weight at delivery, gestational weight gain (GWG), number of antenatal visits, history of smoking and alcohol consumption during pregnancy, presence or absence of sexually transmitted infections (particularly HIV, syphilis and hepatitis B), and type of illicit drug use in study subjects. Ages of the women were classified into three categories: <20 years (teen age); 20–34 years (normal age); and ≥35 years (advanced age). Numbers of antenatal visits were also divided into three groups: ≥4 (adequate number); 1–3 (low number); and 0 (no visit). Low number and no visit were considered to be an inadequate number of antenatal visits.

Pregnancy outcomes were obstetric and neonatal outcomes. Obstetric data included: gestational age (GA) at delivery; mode of delivery and adverse maternal outcomes, including anemia at admission for delivery; preterm delivery; premature rupture of the membranes (PROM); preeclampsia; placental abruption; and postpartum hemorrhage. Neonatal data were neonatal birth weight, adverse neonatal outcomes comprising low birth weight (LBW), small for GA (SGA), Apgar score less than 7 at 1- and 5 min, congenital anomalies and neonatal death. GA was calculated based on last menstrual period and/or by ultrasound confirmation. A diagnosis of SGA was made using a Thai infant birth weight nomogram [18].

Statistical analysis was performed with the IBM SPSS Statistics version 22.0 (IBM corporation, Armonk, NY, USA). Student *t* test was used to compare continuous variables. Univariate and multivariate analyses were used to determine significant maternal characteristics and pregnancy outcomes associated with illicit drug use during pregnancy. Data were presented as crude and adjusted odds ratios

(ORs) with 95% confidence intervals (CIs). All statistical analyses used two-sided tests with an overall significance level of $\alpha = 0.05$.

Results

A total of 17,555 women who had lived in the BMR for at least five years gave birth at our institution during an 8-year period, 199 (1.13%) of whom reported use of illicit drug(s) during pregnancy. These 199 drug users (study subjects) were matched to 796 non-users (controls). Of these, one control had multiple pregnancy, seven (one study subject and six controls) had underlying medical diseases and three (one study subject and two controls) had a history of spontaneous preterm delivery. Hence, 197 study subjects and 787 controls remained for analysis.

Mean ages of women in the study group and control group were 25.1 ± 6.6 years and 27.2 ± 6.6 years ($P < 0.001$), respectively. Study subjects had a significantly lower number of antenatal visits than controls (2.9 ± 3.6 times vs. 8.5 ± 3.9 times, $P < 0.001$). Further characteristic features of women in the study group and control group are presented in Table 1. In univariate analysis, age, ethnicity, level of education, marital status, occupation, number of antenatal visits, smoking and alcohol intake were significantly associated with drug use during pregnancy. After controlling for potential confounders, smoking was identified as the greatest risk factor associated with illicit drug use (adjusted OR [aOR] 41.03, 95% CI 18.90–89.04). Other positive risk factors were teenage pregnancy, low level of education (secondary school or lower) and inadequate number of antenatal visits. On the contrary, women of non-Thai ethnicity were less likely to use illicit drugs.

Obstetric outcomes of women in both groups are summarized in Table 2. The mean GA at delivery of the study group was significantly shorter than that of the control group: 37.0 ± 2.3 weeks vs. 38.3 ± 1.4 weeks, $P < 0.001$. Moreover, the study group was found to be at significantly higher risk for being anemic at admission for delivery, preterm delivery and PROM but lower risk for cesarean section than the control group. These outcomes, except PROM, remained significant after adjustment for potential confounding factors. The aORs of anemia, preterm delivery and cesarean section in the study group were 1.73 (95% CI 1.05–2.85), 2.35 (95% CI 1.29–4.29) and 0.43 (95% CI 0.21–0.86), respectively.

Table 3 shows neonatal outcomes of the study group and control group. Neither congenital anomalies nor neonatal death was observed in all 984 infants. Univariate analysis demonstrated that study subjects had a significantly higher risk of LBW, SGA and low 1-min Apgar score than control subjects. In multivariate analysis, only risks of LBW and SGA remained significant: 2.26-fold (95% CI, 1.23–4.17) and 3.19-fold (95% CI, 1.39–7.33), respectively.

We further evaluated trends in drug use among urban pregnant women over the study period. The prevalence rates of drug used by year from 2008 to 2015 are shown in Table 4. The highest use rate was 2.26% in 2013 and the lowest use rate was 0.32% in 2009. All of the 199 pregnant drug users consumed ATS; however, with different numbers and routes of administration. The most commonly used ATS was methamphetamine oral tablet. The majority (89.45%) of drug users consumed a single type of ATS while the remaining 10.55% used both oral tablet and inhaled crystalline methamphetamine.

Discussion

Illicit drug use is a big global public health problem. Although evidence suggests that treatment for illicit drug use can reduce the risk of morbidity and mortality [19], identification of drug users, particularly pregnant drug users, is often overlooked.

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