



Contents lists available at ScienceDirect

Journal of Substance Abuse Treatment



Substance use, treatment, and demographic characteristics of pregnant women entering treatment for opioid use disorder differ by United States census region

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ARTICLE INFO

Article history:

Received 14 September 2016

Received in revised form 8 December 2016

Accepted 23 January 2017

Available online xxx

Keywords:

Opioid use disorder

Pregnancy

Medication assisted treatment

Methadone

Buprenorphine

Benzodiazepine

ABSTRACT

Opioid use disorder (OUD) among pregnant women increased substantially between 1992 and 2012 across the United States, with the greatest increases occurring in the southern states. We analyzed the 2013 Treatment Episodes Database-Admissions to determine how substances used, characteristics of treatment, and demographics of pregnant women entering treatment for opioid use disorder vary between geographical regions. Analyses were restricted to cases where women reported being pregnant at the time of admission and reported opioids as the primary substance problem leading to the treatment admission. Characteristics were compared between U.S. census regions using Chi-square tests and logistic regression with the South census region as the reference group. Compared to the South, pregnant women admitted for OUD treatment in other regions were 33–79% less likely to use benzodiazepines, twice as likely to be admitted to medication assisted treatment (MAT), 2–3 times more likely to use heroin, and up to 1.5 times more likely to inject drugs. Fewer women in the South reported having medical insurance, education beyond high school, and being married. There is a need in the southern U.S. for policies and treatment programs to target reducing concomitant opioid and benzodiazepine use, increasing access to, and utilization of, MAT, and increasing access to medical insurance.

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1. Introduction

Opioid use has risen among pregnant women in the United States since the 1990s, with the largest increases attributed to prescription opioids which accounts for 28% of pregnant admissions to substance abuse disorder treatment as of 2012 (Martin, Longinaker, & Terplan, 2015). Opioid use during pregnancy increases the risk for adverse pregnancy outcomes including fetal loss, pre-term birth and intrauterine growth restriction (Behnke et al., 2013). Gestational opioid exposure also adds a risk of the infant developing neonatal abstinence syndrome (NAS) (Finnegan, Connaughton, Kron, & Emich, 1975; Kocherlakota, 2014). In concordance with the rise in opioid use during pregnancy, incidence of NAS in the U.S. increased between 2000 and 2012 from 1.2 to 5.8 per 1000 hospital births (Patrick, Davis, Lehman, & Cooper, 2015; Patrick et al., 2012). The highest incidence rate of NAS has been reported in the East South Central U.S. census division (16.2 per 1000 hospital births) where increases in opioid use disorder in pregnant women have also been the greatest (Patrick et al., 2015; Patrick et al., 2012).

A deeper examination of the geographical differences among pregnant women with opioid use disorder could identify unmet treatment

needs in specific geographical areas. For example, some locations may have higher rates of concomitant substance use; these variations have important implications. Use of cocaine and/or benzodiazepines in addition to opioids results in poorer substance use disorder treatment outcomes (Downey, Helmus, & Schuster, 2000; Williamson, Darke, Ross, & Teesson, 2006), while concomitant benzodiazepine and opioid use is associated with increased risks for overdose and overdose death (Chan, Stajic, Marker, Hoffman, & Nelson, 2006; Lee, Klein-Schwartz, Doyon, & Welsh, 2014). Prenatal exposure to opioids combined with either cocaine, benzodiazepines, or high levels of tobacco during pregnancy is associated with more severe neonatal withdrawal and longer newborn hospital stays (Abdel-Latif et al., 2006; Cleary et al., 2012; Jones et al., 2013; Seligman et al., 2008).

There may also be geographical variations in how opioid use disorder is treated, and factors that may affect access to treatment such as insurance coverage, delays to entering treatment, and source of referral for treatment. The types of treatment being used, such as detoxification, drug-free counseling, and medication assisted treatment (MAT), differ in their effectiveness. MAT involving methadone or buprenorphine combined with comprehensive behavioral and medical care is the universally accepted and recommended treatment for opioid use disorder in pregnant women (ACOG Committee on Health Care for Underserved Women & American Society of Addiction Medicine, 2012; Kampman & Jarvis, 2015; World Health Organization, 2009). Among those who used prescription opioids, the percentage of pregnant

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women who received MAT decreased nationally from 44% in 1992 to 37% in 2012 (Martin et al., 2015). It is unknown, however, whether utilization of MAT among pregnant women differs by geographic area. Underutilization of MAT may be related to lacking insurance coverage, limited capacity, and other barriers that could be common in geographic regions.

Finally, while pregnant admissions for opioid use disorder in the U.S. have become increasingly younger, unmarried, and non-Hispanic white between 1992 and 2012 (Martin et al., 2015), it is unclear whether this profile of pregnant admissions differs across geographic regions. Identifying the demographic profile of pregnant women with opioid use disorder by region could lead to more tailored prevention and treatment efforts.

The present study sought to fill existing knowledge gaps by analyzing national data from women admitted for treatment of opioid use disorder who reported being pregnant at the time of admission. Specifically, we sought to compare data related to self-reported substances used leading to the treatment admission, the characteristics of the treatment to be received (e.g., type and setting of treatment, insurance coverage), and demographic characteristics between U.S. census regions. Given that opioid use in pregnancy has increased the most in the southern U.S., analyses were aimed at identifying factors that uniquely characterize the needs of women in this region to determine avenues for ameliorating geographical disparities.

2. Materials and methods

2.1. Data source

The Treatment Episodes Data Set-Admissions (TEDS-A) is a national census data system of annual admissions to public and private substance use disorder treatment facilities that receive public funding (Substance Abuse and Mental Health Services Administration (SAMHSA), 2015). The publicly available 2013 TEDS-A was downloaded and used for this analysis. The dataset includes annual data on the number and characteristics of persons admitted to treatment programs. Data are collected by all 50 states, Washington DC and Puerto Rico and is estimated to include 83% of all eligible drug or alcohol treatment admissions in the U.S. The current study was deemed exempt for review by the Thomas Jefferson University Institutional Review Board.

2.2. Study population

Analyses were restricted to cases where women reported being pregnant at the time of admission and reported opioids (i.e., heroin, other opiates and synthetics, or non-prescription methadone or buprenorphine) as the primary substance problem leading to the treatment admission. A total of 8656 admissions met these criteria and were included in analyses. TEDS does not distinguish between treatment admissions and readmissions.

2.3. Census region classification

The four geographic regions included the Northeast, Midwest, South and West and were based on regions defined by the U.S. Bureau of Census, 1970 Census of Population. They are comprised of the following states and territories: Northeast: New England Division (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) and Middle Atlantic Division (New Jersey, New York); Midwest: East North Central Division (Illinois, Indiana, Michigan, Ohio, Wisconsin) and West North Central Division (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota), South: South Atlantic Division (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia) and East South Central Division (Alabama, Kentucky, Mississippi, Tennessee), and West South Central Division (Arkansas, Louisiana, Oklahoma, Texas); and West:

Mountain Division (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming) and Pacific Division (Alaska, California, Hawaii, Oregon, Washington). Data were not available in 2013 for Pennsylvania.

2.4. Substance use characteristics

All substance use data contained in TEDS-A are self-reported by the individual admitted to treatment. Substance use characteristics assessed in this analysis included: primary substance problem leading to the current treatment admission (prescription opioid or heroin), current intravenous drug use (yes, no), current polysubstance use (yes, no), and other substance(s) reported as leading to the admission. Prescription opioid use was defined as the reported use of other opiates and synthetics (i.e., buprenorphine, codeine, hydrocodone, hydromorphone, meperidine, morphine, opium, oxycodone, pentazocine, propoxyphene, tramadol, and any other drug with morphine-like effects) or non-prescription methadone at the time of treatment admission. Those reporting a secondary or tertiary substance leading to the admission were classified as exhibiting polysubstance use, and these substances included alcohol, benzodiazepines, cocaine, marijuana, and opioids (prescription opioid or heroin) differing from the primary substance problem.

2.5. Treatment characteristics

Characteristics of the current treatment admission assessed included: planned use of MAT for the current admission (yes, no), the treatment setting for the current admission (detoxification, other), wait time for admission (<1 week, 1 week or more), source of referral for the admission (court/criminal justice referral, other), psychiatric problem in addition to alcohol/drug problem (yes, no), and whether the person had a prior substance use disorder treatment episode (yes, no).

2.6. Demographic characteristics

Self-reported demographic characteristics assessed at the time of admission included: age in years (<20, 21–29, 30–39, 40 or more), race (black, white, other), ethnicity (Hispanic, non-Hispanic), highest level of education (less than high school, high school, greater than high school), employment status (employed, not employed), insurance status (insured, not insured), and marital status (married, not married). Insurance status was not differentiated between public or private insurance and may or may not have covered the treatment episode of interest.

2.7. Statistical analyses

Differences in demographic characteristics by census region were assessed using Chi-square tests. We examined independent associations with substance use and treatment characteristics by census region using multivariable logistic regression with the South as the reference group. We used the South as the reference group based on previous reports of high NAS incidence and prenatal opioid use in this region. Multivariable logistic regression analyses were completed controlling for age, race, ethnicity, educational attainment, and state. Marital status and insurance status were not included in the multivariate models due to the large number of missing responses (16.2% and 55.3%, respectively). Results were expressed as odds ratios along with their corresponding 95% confidence intervals. *P* values of *P* < 0.05 were considered to be significant. All statistical analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC, USA).

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