



Implementation of Universal Maternal Drug Screening to Identify Neonatal Abstinence Syndrome Candidates

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ARTICLE INFO

Keywords:

Universal drug screening
Neonatal abstinence syndrome
Neonate
Drug abuse
Illicit drugs

ABSTRACT

Maternal drug use while pregnant can contribute to subsequent neonatal drug withdrawal. Early identification of at risk neonates for drug withdrawal can be accomplished with implementation of universal drug screenings when hospitalized for an infant's delivery. This article explores drug abuse nationally and in the state of Ohio specifically. It examines possible causation of the growing epidemic of drug usage among women and the impact of intrauterine drug exposure on neonates as exhibited by neonatal abstinence syndrome. The process of universal maternal drug screening implementation to identify neonates at risk for drug withdrawal post-birth in one Ohio metropolis is discussed.

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The incidence of drug abuse is on the rise. According to the 2010 National Survey on Drug Use and Health, 22.6 million or 8.9% of the population 12 years and older were current (within the past month) users of illicit drugs. Illicit drugs were defined as marijuana/hashish, cocaine, heroin, hallucinogens, inhalants, and non-medical use of psychotherapeutics.¹ This rise was statistically significant from the 8.3% rate in 2002. Illicit drug users 26 years or older equated to 12.8 million people. Marijuana was the most commonly abused drug with an increase from 5.8% in 2007 to 6.9% in 2010 or 4.5 million people and pain killers was the second most common class of drugs being abused.¹ Users of pain reliever medications rose from 1.5 million to 1.9 million nationally including use among pregnant women and exposure of the unborn. One methodology to address earlier detection of infants exposed to intrauterine drugs is universal drug screenings of mothers when they are hospitalized for impending deliveries.

Drug Use Demographics

The National Survey on Drug Use and Health in 2010 focused on the demographics of drug use. Variables examined included ethnicity, geographical location, education, socioeconomic status, and differences between men and women. Among those 18 years or older, there was a higher rate of drug use among American Indians or Alaska Natives (16.0%) than people declaring two or more races and Hispanics (9.7%), Caucasians (8.9%), African Americans (8.2%) Native Hawaiians or Pacific Islanders

(5.6%), and Asians (4.1%).¹ Geographically, US drug use in 2010 was highest in the West (10%) followed by the Northeast (8.9%), Midwest (8.8%), and South (7.8%).

People with a greater amount of education were less likely to engage in drug use as demonstrated by drug use rates of college graduates, high school, and those without high school educations and partial college education respectively: 7.3%, 8.3%, 10.2%, and 10.6%.¹ Those unemployed had a 15.7% rate of drug use versus those employed full time with a 8.9% rate or part-time employees with a 10.9% rate of drug use.

In addition, the difference between male and female drug usage was 11.2% versus 6.8%.¹ Females aged 12 to 17 years were more likely than males to be users of non-medical psychotherapeutic and pain relieving drugs (3.7% versus 2.3% and 3.0% versus 2.0%). Furthermore, women aged 8 to 22 years were cited as becoming drug dependent more quickly due to risk factors such as low self-esteem, peer pressure, and depression according to the National Center in Addiction and Substance Abuse at Columbia University.² According to the CDC, women are more likely to suffer from chronic pain, use prescription painkillers for a longer period of time and use higher doses than men. Dependency develops in women more quickly and women obtain prescriptions from multiple prescribers more readily.^{3,4}

Drug use leading to drug overdose is another concern. Deaths from drug overdose were 37,004 in 2009, which increased to 38,329 in 2010 nationally.⁵ Opioid overdose caused 4030 deaths in 1999 compared to 16,651 deaths in 2010 nationally. The National Vital Statistics System reported an increase in drug overdose in women attributable to differing classes of drugs from 1999 to 2010.⁴ Deaths from overdose also rose concomitantly as seen with heroin overdoses which were 306 in 1999 and 584 in 2010 respectively and with cocaine overdose increases from 850 to 1132.⁴ Opioid overdoses increased from 1287 people in 1999 to 6631 in 2010 and benzodiazepines increased from

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420 to 2579 in 2010. The rate of drug overdose for antidepressant usage increased from 926 people to 2204 people in 2010.

The Center for Disease Control and Prevention cited 48,000 deaths for women from prescription painkillers between 1999 and 2010 which is a 415% increase versus an increase of 265% deaths from overdoses in men.⁶ The CDC cites this specific issue as a growing epidemic for women and defines prescription painkillers as opioid or other narcotic pain relievers. A particular concern is women aged 25 to 54 years because of their increased utilization of emergency departments for issues related to painkiller misuse or abuse when compared to other women's age groups.^{3,6} That age group includes a significant portion of childbearing women. In Ohio in 2009 alone, drug abuse and misuse contributed to 25% of emergency room visits with more than 50% being associated with non-medical use of prescription drugs, over-the-counter medications or other pharmaceuticals.⁷

The National Survey on Drug Use and Health of 2010 also included analysis of drug use among pregnant women. Examination of this group implies the concomitant risk of intrauterine exposure of drugs for neonates. Drug use may result from prescriptive and non-prescriptive drug use or stem from use of illicit drugs.¹ Antepartum maternal opioid use specifically rose from 1.19 per 1000 births to 5.63 hospital births annually from 2000 to 2009.⁸ This intrauterine exposure contributes to neonatal abstinence syndrome or NAS which is a cluster of neonatal problems associated with drug withdrawal.⁹ The Centers for Disease Control and Prevention stated that cases of neonatal withdrawal increased by an estimated 300% from 2000 to 2009 and the incidence of neonatal abstinence syndrome increased from 1.2/1000 births in 2000 to 3.39 per 1000 births in 2009 according to Patrick and colleagues.^{3,8} Another survey that utilized the Nationwide Inpatient Sample (NIS) developed by the Agency for Healthcare Research and Quality found 2920 to 9674 infants having been discharged using the ICD-9 code 779.5 (drug withdrawal syndrome in a newborn) for neonatal abstinence syndrome from 2000 to 2009.⁸ Patrick et al.⁸ also cited an increase of NAS infants from 1.20 per 1000 births in 2000 to 3.39 in 2009. A final source identified the use of ICD-9 779.5 in 7653 neonates in 1995 which has since increased to 11,937 neonates in 2008.⁹

State specifics that illustrate the dramatic increase in drug withdrawal incidence include 1.4/1000 infants with drug withdrawal in the state of Washington in 2000 versus 4.8/1000 in 2009 and Florida's fourfold increase in drug withdrawal infants from 1/1000 in 2005 to 4/1000 in 2009.¹⁰ The state of Ohio has a slightly lower rate of drug use when compared to the national rate of 8.9%. Ohio's rate of illicit drug use in the past month for those 12 years and older is 7.87%.¹⁰ This usage is higher for 18 to 26 year olds (20.86%) and decreases for the 26 years and older population to 5.44%.¹⁰ Alternately, a rise in Ohio's death rate specifically from drug overdose has increased sharply. In 1999, the national rate for unintentional drug overdose was 2.9 per 100,000 and Ohio's rate was 2.9.¹¹ By 2006, Ohio's rate had increased to 11.1 and it had again increased to almost 13 per 100,000 by 2008.¹¹ Counties associated with the increase rates were predominantly located in the southern region of the state.¹¹ Opioid prescriptions in Ohio rose by 325% from 1999 to 2007 and deaths associated with drug poisonings increased by 304% in the same period.^{11–13} That death rate equates to five deaths daily or 1 every 5 hours. It is the leading cause of injury-related deaths; greater than motor vehicle accidents, suicides, and falls.^{11–13}

Prescription drug and poly-drug usage contributed largely to drug overdoses. Opioids were specifically cited in 2/3 of the deaths. In 2011, 44.7% of unintentional overdose deaths involved prescription opioids, especially Oxycodone (Oxycodone, Purdue Pharma, Stamford, CT), Vicodin (Hydrocodone, Abbott Laboratories, North Chicago, IL), and Morphine (Avinza, King Pharmaceuticals, Bristol, TN) at 28.6%.

Other drug classes and drug overdoses associated with their use include heroin at 24.15%, benzodiazepine at 20.6%, and methadone at 9%.⁶ Polydrug usages were associated with 71% of drug deaths. According to the Ohio Violence and Injury Prevention Program, 21% of the fatalities were not associated with a specific drug with consequent underestimation of the impact of drug usage on fatalities being suspected.⁶

The National Survey on Drug Use and Health questioned pregnant women between the ages of 15 to 44 years about their drug usage.¹ Their rate of illicit drugs was 4.4% in 2009–2010 when compared to non-pregnant female drug users with a rate of 10.9%. That rate decreased slightly from the 2007–2008's rate of 5.1%.¹ Women aged 15 to 17 years represented the largest group of users with a rate of 16.2%.

Pregnant women were further differentiated by types of drugs abused. One in six pregnant women aged 15–44 years smoked cigarettes during the last month before the survey although their rate was less when compared to non-pregnant women (16.3% versus 26.7%).¹ Expectant women between the ages of 18 to 25 years reported a 22.7% rate of smoking versus 31.2% for non-pregnant women and those between 26 and 44 years cited a smoking rate of 11.8% versus 27%. The exception to pregnant women smoking less than their non-pregnant counterparts was with the 15- to 17-year-old group. That group smoked more than their counterparts (22.7% vs. 13.4%).¹

Alcohol use during pregnancy was divided between current use, binge drinking, and heavy drinking. For each drinking category, smaller rates were demonstrated in the pregnant group when compared with non-pregnant women. Women aged 15 to 44 years had a 10.8% rate of current alcohol use, a binge drinking rate of 3.7%, and a heavy drinking rate constituting 1.0%.¹

The socioeconomic concern over the cost of care associated with drug use, abuse and for NAS infants is ever present. In 2007, abuse of prescriptive opioids costs \$55.7 billion.¹⁴ Cost was attributed to loss of work potentials, medical care, and criminal justice interventions. Unintentional fatal poisonings in Ohio alone cost \$3.5 billion annually with hospital admissions associated with non-fatal poisonings costing \$31.9 billion.^{7,13} Total hospital charges associated with care of NAS increased from \$190 million to \$720 million from 2000 to 2009.⁸ Mean hospital charges associated with care of NAS infants rose from \$39,400 in 2000 to \$53,400 in 2009 according to Patrick et al.,⁸ with three fourths of the charges being attributed to Medicaid programs.

These numerous statistics cause concern as to why drug usage nationally has increased. Examination of the growing epidemic of drug usage, especially among women abusing prescription pain killers, may be attributed to several causes. Reasons cited, according to Ohio Violence and Injury Prevention, include changes in medical and societal trends.⁷ National and statewide efforts to address deficits in clinical pain management in the 1990's resulted in passage of The Ohio Revised Code 4731.21 Drug Treatment of Intractable Pain which increased the quantity of analgesic prescriptions and concomitant exposure to opioid drug usage because of a lack in regulation of these prescriptions by physicians.¹¹ Prescription painkillers increased fourfold from 1999 to 2010 according to the CDC.

A second possible contributory cause could be the rise of extended release opioid prescriptions. An increase in marketing of these drugs could be demonstrated by the \$12 million spent by pharmaceutical companies in 1989 compared to \$2.38 billion in 2001.¹¹ Nationally, there was also an increase in non-medical pharmaceutical emergency room visits from approximately a half million to one million visits from 2004 to 2009 and a 137% increase in visits related to narcotic pain relievers to almost 2 million visits.¹⁴ A subsequent 325% increase in opioid availability was noted with its unintentional drug overdose death rate increase by 305%.¹¹

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