Maternal and Neonatal Outcome Effects of Substance Use Disorder in Pregnancy: A Quality Assurance/Improvement Study

Vallejo MC,[1] Ciamarra J,[1] Damanhuri M,[1] Lilly CL, Nield L,[1] Zakowski M.[2]
West Virginia University,[1] Cedars-Sinai Medical Center[2]

- **Background:** Substance use disorder (SUD) is characterized by the **continued use** of substances despite the presence of significant harm to the individual and others. SUD affects **14.5%** of the United States population and involves substances such as alcohol, cannabis, opioids, stimulants (e.g., nicotine, tobacco, cocaine, amphetamines), benzodiazepines, barbiturates, and others. SUD in pregnancy is associated with preterm birth, delayed mental development, and congenital disorders
- **Hypothesis:** **Compare maternal** and **neonatal outcomes** in parturients with **positive urine toxicology screens** to those without a positive screen

Study Design & Methods

- Institutional Review Board approval
- 2023 EMR annual data was collected from 75 parturients who tested positive in their urine toxicology, matched to 75 controls.
- **Measured variables**: maternal age, race, ethnicity, insurance type, gestation, labor type, anesthesia type, delivery method, birth weight, live birth status, breastfeeding before hospital discharge, Apgar scores at 1 and 5 minutes, NICU admission, and total length of hospital stay.
- **Data Analysis**: interval data was analyzed using t-test, nominal data with Chi-square and Fisher's exact tests for small cell sizes.
- **$P < 0.05$ is significant**

Results

- **Substances identified** in urine samples included **cannabinoids (49%), amphetamines (33%), buprenorphine (22%), fentanyl (18%), cocaine (11%), methadone (4%), oxycodone (4%), other opiates (7%),** and **barbiturates (1%)**
- **No differences** with respect to maternal age, race, ethnicity, 5-minute Apgar score < 7, or total length of hospital stay. **Differences occurred** in parturients who tested positive to:
  - **Gestational age (36.4 ± 3.3 vs. 38.1 ± 2.4 weeks, p = 0.0006)**
  - **Insurance type (42% vs. 20% Medicaid, p = 0.002)**
  - **labor type (33% vs. 14% cesarean delivery without labor; 25% vs. 60% labor induction; 41% vs. 31% spontaneous labor, p = 0.0015)**
  - **Anesthesia type (46% vs. 62% epidural; 32% vs. 21% spinal; 11% vs. 1% general anesthesia; 12% vs. 16% no anesthesia, p = 0.025)**
  - **Delivery method (47% vs. 30% cesarean; 53% vs. 70% vaginal, p = 0.031)**
  - **Birth weight (2726.2 ± 747.8 gm vs. 3257.9 ± 592.5 gm, p < 0.0001)**
  - **1-minute Apgar score < 7 (29% vs. 12%, p = 0.008),**
  - **NICU admission (46% vs. 16%, p < 0.0001)**
  - **Breastfeeding (36% vs. 65%, p = 0.0004)**

Discussion & Conclusion

- **Discussion**: Parturients with SUD are more likely to deliver **preterm (p = 0.0001)**, have **Medicaid insurance (p = 0.002)**, require **general anesthesia (p = 0.04)**, undergo **cesarean delivery (p = 0.03)**, have a **birth weight ≤ 2,500 grams (p = 0.0001)**, require **NICU admission (p = 0.0001)**, and **not breastfeed** during admission **(p = 0.0004)**
- **Conclusion**: **Increased awareness** of these risk factors and **policy modification** can improve maternal and neonatal outcome