

Fetal Surveillance in Late Pregnancy and During Labor

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KEYWORDS

• Illegal substance abuse • Mother • Fetus • Antepartum testing

KEY POINTS

- During early gestation, drugs have teratogenic effects and can be associated with structural anomalies in the fetus.
- Substance abuse can have physiologic effects on the mother and fetus, including decreased uterine blood flow, increased vascular resistance, and an increase in fetal blood pressure.
- Women with increased risk for stillbirth should undergo antepartum fetal surveillance using a nonstress test (NST), contraction stress test, biophysical profile (BPP), or modified BPP.
- Initiating antepartum fetal testing at 32 weeks of gestation is appropriate for most pregnancies at an increased risk of stillbirth.
- Because of the high incidence of low birth weight, fetal anomalies, preterm delivery, and growth restriction, obtaining an ultrasonogram for appropriate pregnancy dating, a detailed anatomic survey, and cervical length at 20 weeks of gestation is recommended.
- In patients who are abusing stimulants such as methamphetamines and cocaine, fetal growth should be closely followed every 3 to 4 weeks and, owing to the generalized vasoconstriction that these patients develop, antenatal testing should be started routinely at 32 weeks with twice-weekly NSTs and a once-weekly modified BPP.

INTRODUCTION

Once gestation is beyond 20 weeks, clinicians have to address the impact of illicit substances on fetal growth, placentation, and the possibility of early delivery. Cannabis remains the most commonly used illicit drug in the United States.¹ Other agents used by pregnant patients include heroin, cocaine, hallucinogens, inhalants, alcohol,

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and prescription psychotherapeutics.² An estimated 4.4% of pregnant women report illicit drug use in the preceding 30 days.³ During early gestation drugs have teratogenic effects, and can be associated with structural anomalies in the fetus.^{4,5} Substance abuse can have physiologic effects on the mother and fetus, including decreased uterine blood flow, increased vascular resistance, and an increase in fetal blood pressure.¹ As pregnancy advances, these substances can have more subtle effects that can lead to abnormal fetal growth, alterations in fetal growth, alterations in neurotransmitters and their receptors, and brain organization.

The effects of illegal substance abuse during pregnancy should be addressed with caution given the nature of the available evidence. Investigators have raised at least 4 issues that are of particular concern when analyzing these data:

1. The difficulty of accurately measuring illicit substance-use patterns in women throughout pregnancy.
2. The difficulty in separating the effects of drug use from the effects of other adverse confounding personal and social circumstances.
3. The existence of a common pattern of polysubstance use in this population.
4. Possible publication bias or apparent reviewer editorial bias that results in preferential publication in the scientific literature of studies that show unfavorable outcomes in association with substance use.⁶

This article describes the effects of substance use during pregnancy on fetal growth and surveillance in the antepartum and intrapartum period, based on the research available and the authors' own clinical experience.

MATERNAL AND FETAL CONSEQUENCES OF ILLICIT SUBSTANCE USE IN PREGNANCY ***Marijuana or Cannabis***

As already mentioned, marijuana is one of the most commonly used drugs in the United States during pregnancy, and its use appears to be increasing steadily in those aged 12 years or older.³ Δ 9-Tetrahydrocannabinol is the active ingredient in marijuana, and readily crosses the placenta. Of importance is that marijuana produces higher blood carboxyhemoglobin levels than are produced by cigarette smoking. These higher concentrations of carboxyhemoglobin can affect fetal oxygenation and, ultimately, fetal growth and development.³

Opioids

Addiction to opioids can develop by repetitive use of either prescription opioid analgesics or heroin.⁴ Heroin is a highly addictive substance with a short half-life, which can be injected, smoked, or nasally inhaled. Commonly prescribed opioids such as codeine, fentanyl, morphine, methadone, oxycodone, and hydrocodone are the most burgeoning drugs of abuse in the United States.^{4,7} Although the usual route of administration of these medications is oral, they are also injected, nasally inhaled, smoked, used as dermal patches, or used as suppositories.⁴ All of these agents have the potential for overdose, abuse, addiction, and physical dependence.

The continued use of illicit opioids and the associated lifestyle represents the greatest threat to the well-being of the mother, fetus, and neonate.⁸ Severe opioid withdrawal can lead to fetal death because of the offspring's experience of acute opioid abstinence syndrome.⁴ Untreated heroin use is associated with an increased risk of fetal growth restriction, abruptio placenta, fetal death, preterm labor, and intrauterine passage of meconium.³ Compared with nonusers, heroin abuse increases the risk of a mother having a low birth weight neonate 4.6-fold.³

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