

# Fetal Tachycardia Associated With Maternal Use Of Pseudoephedrine, An Over-The-Counter Oral Decongestant

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We present a case of fetal tachycardia associated with maternal use of long-acting pseudoephedrine, an over-the-counter decongestant. No previous studies exist on pseudoephedrine or other over-the-counter decongestants and their effect on the fetal heart. The elevated fetal heart rate led to difficulty in interpreting a nonstress test.

The normal human fetal heart rate at term is 110 to 160 beats per minute.<sup>1</sup> Drugs that can cause elevated fetal heart rates include  $\beta$ -sympathomimetics (e.g., terbutaline), used for inhibition of premature labor, and parasympatholytics (e.g., atropine, scopolamine), which can also diminish fetal heart rate variability. Fetal tachycardia can also be caused by abnormal maternal or fetal health conditions, such as maternal or fetal infection, fever, fetal asphyxia, fetal anemia, fetal heart failure, fetal tachyarrhythmia, and maternal hyperthyroidism.<sup>1,2</sup>

## Case Report

The patient, a 31-year-old clinical pharmacist, gravida 2, para 1, had an obstetric history of Cesarean section at term for cephalopelvic disproportion. At 39 weeks' gestation, the patient was given a nonstress test because of her obstetric history. The nonstress test was difficult to interpret because of an elevated baseline fetal heart rate of 175 to 185 beats per minute with decreased variability (Figure 1). The patient had been taking long-acting pseudoephedrine 120 mg (Sudafed LA<sup>TM</sup>, Burroughs Wellcome Co., Research Triangle Park, NC) every morning for 7 days to treat nasal congestion. The patient was asked to report

for a repeat nonstress test the following day. The patient discontinued the pseudoephedrine because she was concerned about the repeat test. The repeat nonstress test showed a baseline fetal heart rate of 150 beats per minute with normal variability (Figure 2).

Before starting the pseudoephedrine, the baseline fetal heart rate had been 140 to 156 beats per minute on three readings during the previous 3 weeks. On admission to the hospital for delivery, 3 days after the initial nonstress test, the baseline fetal heart rate was 140 to 150 beats per minute.

At the time of the initial nonstress test, the patient was receiving no other medications and had no subjective fever. There were no other apparent reasons for fetal tachycardia. A 9-pound, 6-ounce boy was delivered by Cesarean section after a vaginal attempt failed as a result of cephalopelvic disproportion. The 1- and 5-minute Apgar scores were 9 and 9, and the umbilical-cord arterial blood pH was 7.38.

## Discussion

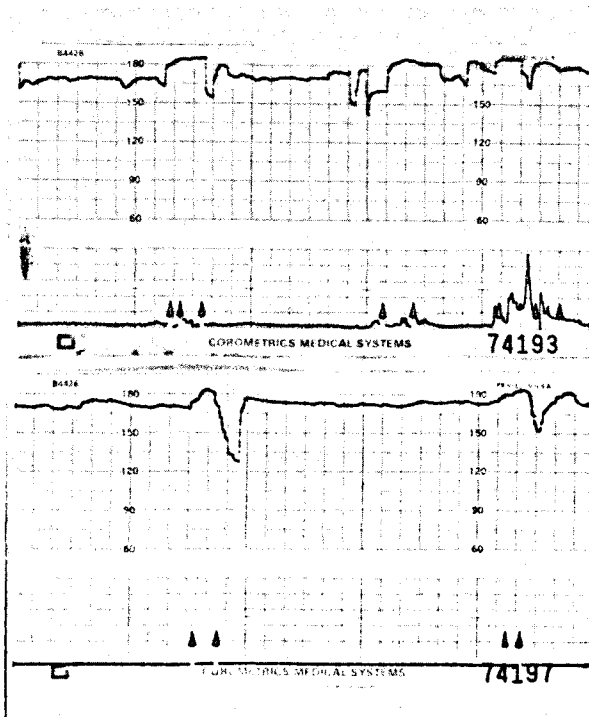
Pseudoephedrine is an over-the-counter sympathomimetic decongestant. It stimulates both  $\alpha$ -adrenergic and  $\beta$ -adrenergic receptors but is used clinically for its effect on  $\alpha$ -adrenergic receptors. Stimulation of  $\alpha$ -adrenergic receptors causes vasoconstriction, resulting in nasal decongestion.

Although no studies report on the placental transfer of pseudoephedrine or on its effect on the fetal heart, a study does exist on ephedrine, a stereoisomer of pseudoephedrine. Administration of intramuscular ephedrine 25 to 50 mg, used to treat maternal hypotension, is associated with increases in fetal heart rate and beat-to-beat variability.

These changes are dose related and are not associated with fetal asphyxia as judged by measurement of fetal scalp blood pH and Apgar scores.<sup>3</sup> A study on placental transfer of ephedrine and neonatal outcome found that the level of

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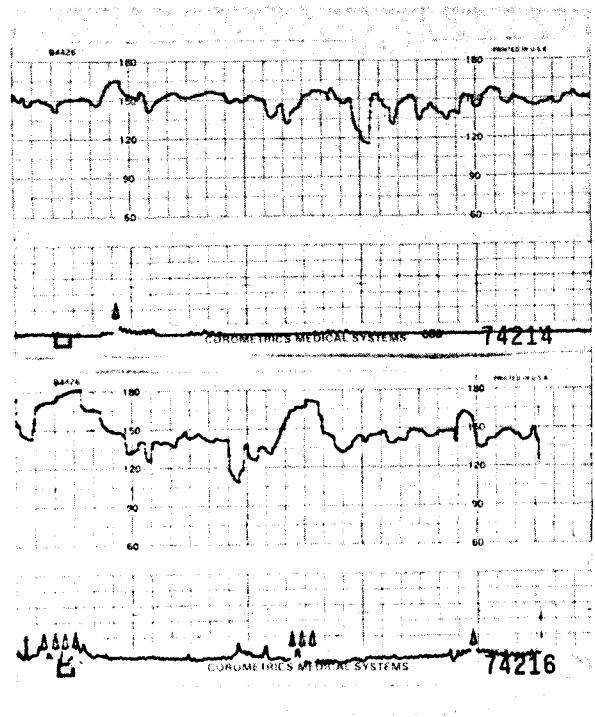
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**Figure 1.** Fetal monitor tracing showing increased fetal heart rate and decreased variability resulting from ingestion of 120 mg of pseudoephedrine.

ephedrine in fetal blood is directly related to the level in maternal blood. The ratio of drug concentration in umbilical cord venous blood to maternal arterial blood is 0.71. Infants whose mothers were given ephedrine have significantly increased heart rates in 30 minutes of age versus control babies (165 versus 147 beats per minute). No relation has been found between ephedrine levels and Apgar scores at 1 and 5 minutes or between neonatal ephedrine levels and umbilical cord acid-base values.<sup>4</sup>

In this case report maternal use of pseudoephedrine, a drug considered safe<sup>5</sup> in pregnancy, was associated with fetal tachycardia, which resulted in the necessity to repeat the nonstress test. When evaluating fetal tachycardia, clinicians should be aware that over-the-counter decongestants could be the cause. In this case, short-term use of pseudoephedrine did not result in any apparent adverse neonatal outcome; however, the



**Figure 2.** Fetal monitor tracing showing decrease in fetal heart rate and return to normal variability 1 day after discontinuing pseudoephedrine.

effects on the fetus of long-term use of pseudoephedrine remain unknown.

### References

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