

# COCAINE INTOXICATION ASSOCIATED WITH ABRUPTIO PLACENTAE

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**Acute cocaine intoxication has been associated with elevated blood pressure and placental abruption. A retrospective analysis was performed comparing gestational age at the time of placental abruption and response to conventional therapy for elevated blood pressure between patients known to have ingested cocaine and those who were drug free. Data suggest that cocaine ingestion during pregnancy increases the risk of early placental abruption and an elevation of blood pressure that is not as responsive to conventional therapy as pregnancy-induced hypertension.**

**Key words** • cocaine intoxication • placental abruption  
• cocaine abuse and pregnancy

The increased popularity of cocaine, once considered a harmless drug, has begun to present itself as an obstetrical nightmare. According to surveys, there are approximately 4 million to 6 million current users of cocaine, with an estimated 5000 persons/day trying the drug for the first time.<sup>1</sup> There is no stereotype of the cocaine abuser. Cocaine use was once described as a social diversion for the successful, well-educated,

upwardly-mobile professionals, but it is now the second-favored illicit drug after marijuana among high school students.<sup>1,2</sup> The reason for its newfound popularity is the decline in the price of the drug in recent years. In some urban markets, the price has dropped by 30%. The ultimate "high" obtained by smoking freebase cocaine and the relative inexpensiveness of crack cocaine have also led to its increased popularity. The use of this drug during pregnancy can cause hypertension that mimics pregnancy-induced hypertension, but does not respond to conventional therapy.

## METHODS AND MATERIALS

All patients in the study presented in labor at the Howard University Hospital labor and delivery suite, or at an affiliated hospital, between January 1988 and August 1988. Patients' ages ranged from 16 to 35 years. They were gravida 1 to 4 and had no to full prenatal care. There were no previous histories of hypertension, and estimated gestational age (EGA) was 28 to 36 weeks. All patients who tested positive for cocaine by blood and urine analysis, confirmed that they had ingested cocaine (freebase or intravenous) 1 or 2 hours prior to admission to the hospital and onset of labor. Three of the 20 patients studied are presented, illustrating the difficulty in separating this entity from preeclampsia.

## CASE REPORTS

### Case 1

A 21-year-old black woman presented at 35 weeks after cocaine freebasing. She complained of dizziness

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and lower abdominal pain, and denied rupture of membranes or vaginal bleeding. She had no prenatal care or medical illnesses. Her social history was significant for cocaine use daily for 1 year (1.75 gm/day).

On physical examination, blood pressure was 170/99 mmHg; the head and neck examination was normocephalic atraumatic, and pupils were constricted. Both breasts were soft, nontender, and symmetrical. There were no masses or discharge. The lungs were clear. The cardiovascular system had no murmurs. The abdomen was soft, with strong palpable contractions and the fundal height was 30 cm. The pelvic examination was significant for the external genitalia being within normal limits, the vaginal canal was pink and rugated, with no lesions, or bleeding, and the cervix was 100% effaced, 4 cm dilated, and minus one station. The extremities were within normal limits. The neurological examination was significant for the patient being somnolent, but easily aroused.

The laboratory data were significant for a white blood cell count of 4.9 cmm, hemoglobin of 9.7 gm/dl, hematocrit of 29%, platelets 168 cmm, prothrombin time of 9.9 seconds, thromboplastin time of 35.5 seconds, and fibrinogen of 326 mg/dl. The impression was intrauterine pregnancy at 35 weeks by dates, pre-eclampsia, and chronic cocaine abuse.

The patient's blood pressure range was 185 to 141 mmHg systolic and 111 to 92 mmHg diastolic. The fetal monitor tracing was significant for persistent late decelerations. The patient underwent a primary caesarean section for fetal distress and delivered a boy, weighing 1417 grams, with an Apgar score of one at 1 minute, and five at 5 minutes. The placenta was 20% abrupted. Postoperatively, the patient was placed on magnesium sulfate for 24 hours. Hydralazine and methyldopa were used to control blood pressure.

### Case 2

A 21-year-old black woman, gestational age unknown, was found in an apartment on the floor with blood coming from her mouth after having a seizure. She was admitted as Jane Doe to the labor and delivery suite in a post-ictal state.

On admission, physical examination showed a blood pressure of 170/110 mmHg (range: 250 to 210 systolic; 120 to 87 mmHg diastolic), pulse was 70 beats/minute, and respirations were 20 breaths per minute. An ecchymotic area over the right eye and at swollen upper lip were also noted. The lung fields were clear. The cardiovascular examination was within normal limits.

There were no palpable contractions on abdominal examination. The fundal height measured 37 cm and fetal heart tones were auscultated at 150 beats per minute. Pelvic examination revealed the cervix to be 0% effaced and not dilated. Significant laboratory values were white blood cell count 12.9 cmm, hemoglobin 13 gm/dl, hematocrit 38.6% platelets 47,000 cmm, prothrombin 9.7 seconds (control: 11.1 seconds), thromboplastin 27 seconds (control: 30 seconds), and fibrinogen 190 mg/dl; urine drug screen was positive for cocaine. Computerized axial tomography scan of the head showed generalized cerebral edema. The impression was intrauterine pregnancy at 37 weeks by size, eclampsia, and cocaine abuse. The fetal monitor tracing was significant for the onset of fetal bradycardia, not responsive to external resuscitative measures, ie, hydration and oxygen position changes. The patient was taken to the operating room for a caesarean section and delivered a boy, weighing 964 grams, with an Apgar of three at 1 minute and seven at 5 minutes. The placenta was 35% abrupted. The patient was placed on magnesium sulfate therapy and required hydralazine and sodium nitroprusside for blood pressure control.

### Case 3

A 29-year-old black woman presented at 32.8 weeks gestation, complaining of profuse vaginal bleeding and abdominal pain. The patient admits to smoking cocaine approximately 2<sup>1/2</sup> prior to onset of pain. The patient arrived on the labor and delivery suite and fetal heart tones were 80 beats/minute. The uterus was tense to palpation without relaxation. The patient was taken to the operating room for an emergency caesarean section. Upon opening the uterus, 700 cc of bright red blood and clots were obtained. The patient delivered a girl, weighing 1814 grams. Apgar at 1 minute was four, and at 5 minutes, seven. The placenta was 90% abrupted. The patient was placed on magnesium sulfate therapy and required hydralazine and methyldopa for blood pressure control.

### DISCUSSION

Manifestations of cocaine intoxication are determined by the amount of drug ingested, metabolism of drug per individual, and individual tolerance.

The serum half-life of cocaine is approximately 1 hour, but can persist in the plasma for 4 to 6 hours.<sup>3</sup> Cocaine is metabolized predominately to inactive ecgonine methyl ester by plasma and hepatic cholinesterases. Plasma cholinesterase activity is decreased in pregnancy, in the fetus, and in patients with

**TABLE. SIMILARITIES BETWEEN PREECLAMPSIA AND COCAINE INGESTION**

Symptom/Condition	Preeclampsia	Cocaine Ingestion
Elevated blood pressure	X	X
Proteinuria	X	X
Edema	X	X
Placental vasoconstriction	X	X
Reduced uterine blood flow	X	X
Coagulopathy	X	X
Convulsions	Can progress to eclampsia	Acute intoxication

liver disease. Therefore, more norcocaine is formed, an active metabolite that can cause severe toxic effects seen in obstetric patients.

Cocaine abuse during pregnancy is known to cause placental vasoconstriction, decreasing blood flow to the fetus. Increased levels of norepinephrine seen in patients with cocaine use can cause uterine contractibility. Cocaine use during pregnancy has been implicated in causing significant increases in spontaneous abortions, cerebral infarction, stillborns related to abruptio placentae, and preterm births.<sup>2,4,5</sup> The similarities between preeclampsia and cocaine ingestion are noted in the Table.

Cocaine is the only naturally occurring local anesthetic. Its mechanism of action is postulated to be interference with presynaptic reuptake of released norepinephrine, resulting in an excess of transmitters at the postsynaptic sites. It promotes the release and blocks the reuptake of dopamine at the synapses of the sympathetic nervous system.<sup>3</sup> The second mechanism of action is believed to be the desired effect sought by the cocaine abuser,<sup>3</sup> euphoria.

The manifestations of cocaine intoxication are protean,<sup>6</sup> but the most common are sympathetic excitement, agitation, tremors, dysrhythmias, local tissue, and hyperthermia.<sup>6</sup>

In our experience at Howard University Hospital, abruptio placentae has been noted 1 to 5 hours following the last use of cocaine. Gestational ages range

from 27 to 34 weeks. Patients studied gave a history of smoking cocaine throughout the entire pregnancy and received no or only limited prenatal care. The patients reported no prior history of medical illnesses.

Patients presenting with hypertension were treated with conventional therapy and demonstrated refractoriness to blood pressure control with increased doses of hydralazine. There is no antidote to the elevated blood pressure noted with cocaine, and it is necessary to allow the drug to be metabolized and excreted before blood pressure symptoms can be controlled.

Obstetrics is facing a dilemma, and the following questions need to be addressed:

- Is cocaine use exacerbating pregnancy-induced hypertension and preeclampsia?
- Should medical management, ie, MgSO<sub>4</sub>, be altered?
- Will the incidence of abruptio placentae increase, and if so, will it be at an earlier gestation?

The findings described in our patients are consistent with those documented in the literature. Knowing the pharmacology of cocaine and its action at the level of the utero-placental unit and maternal vasculature, hypertension and abruptio placentae are hypothesized to be the sequelae of persistent use during pregnancy. All patients known to have ingested cocaine daily during their pregnancy experienced abruptio placentae and elevated blood pressure that was refractory to the method used at Howard University Hospital in preeclamptic management.

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