

ACUTE CORONARY SYNDROME INDUCED BY INTRAVENOUS EPHEDRINE IN PREGNANT WOMAN WITH NORMAL CORONARIES.

Alexander Gedevanishvili, Antonio Chamoun, Barry F Uretsky, Atiar M Rahman

Division of Cardiology, University of Texas Medical Branch, Galveston, Texas

Corresponding Author: morahman@utmb.edu

ABSTRACT

Intravenous ephedrine administered during a C-section was observed to cause an acute coronary syndrome in a pregnant woman with normal coronaries. The patient developed sub-sternal chest pain, was noted to have 10 beats of non-sustained ventricular tachycardia, ST abnormalities were observed on her ECG and cardiac enzymes were elevated. The patient had normal coronary arteries by angiogram and during a one-year period of follow up no further cardiac events occurred.

Key Words: ephedrine, myocardial infarction, cesarean section

Ephedrine is an alpha agonist alkaloid, widely used in clinical practice. Among myriad side effects of ephedrine, there were highly publicized reports of death in healthy individuals attributed to its pro-arrhythmic effect.¹

There have been case reports on ephedra alkaloids causing acute myocardial infarction (AMI) in men and non-pregnant women² when given as a dietary supplement. However, to our knowledge intravenous ephedrine has not been linked to acute myocardial infarction in young pregnant women with normal coronaries. We report the first case of the intravenous ephedrine inducing AMI in an otherwise healthy woman during c-section.

Case Report

A healthy 26 year old non-diabetic, normotensive, nonsmoker, G3P3, Latin American woman without any significant past medical history or coronary risk factors underwent delivery by Cesarean section. During the delivery the patient was given spinal anesthesia and 10 mg intravenous ephedrine was used to prevent secondary hypotension.

Following the injection of ephedrine the patient complained of mild sub-sternal chest pain and was noted to have a 10 beat non-sustained ventricular tachycardia. The rhythm disturbance resolved spontaneously to sinus rhythm. A 12

lead ECG obtained immediately afterwards demonstrated significant diffuse ST segment depression in the inferior and precordial leads associated with reciprocal ST segment elevation in lead aVL (Figure 1A).

The patient was hemodynamically stable during the whole episode with blood pressure of 110/65mmHg, a heart rate of 110 beats/min., and cardiovascular examination was unremarkable. The patient was started on intravenous nitroglycerin resulting in relief of chest pain as well as resolution of the ECG changes within ten minutes (Figure 1B).

Serial cardiac enzymes confirmed ischemic myocardial injury with a peak CK-MB 20.6 ng/ml (upper limit of normal 5 ng/ml) and Troponin T 0.25 U (upper limit of normal 0.1ng/ml).

The patient denied cocaine use and a work up for collagen vascular disease and hypercoagulable status were negative. Further workup included an echocardiography showing normal LV function and normal coronary arteries on coronary angiography (Figure 2). No further cardiac events took place during the next 12 months of follow up.

DISCUSSION

The process of atherosclerosis begins in early childhood although it manifests at a later date, especially in women. Baseline atherosclerotic

disease has been demonstrated by coronary arteriography to be present in almost half of pregnant women who had myocardial infarction.³ In the remainder various etiologies have been put forward for peripartum AMI namely, hemorrhagic complications,⁴ coronary artery dissection,⁵ collagen vascular disease,⁶ cocaine use,⁷ and Kawasaki's disease.⁸ In our patient none of these factors could be demonstrated to be present.

Intravenous ephedrine is known to induce coronary vasospasm leading to myocardial ischemia and injury⁹ in non-pregnant women. However, although no such reports exist in the literature for young pregnant women, the clinical situation and the laboratory findings in our patient leads us to believe that in the absence of any other risk factors, the documented myocardial injury and ECG changes were probably secondary to coronary vasospasm induced by intravenous injection of ephedrine. The relief of her symptoms and normalization of the ECG changes with nitrates and a normal coronary angiogram further substantiate this assessment.

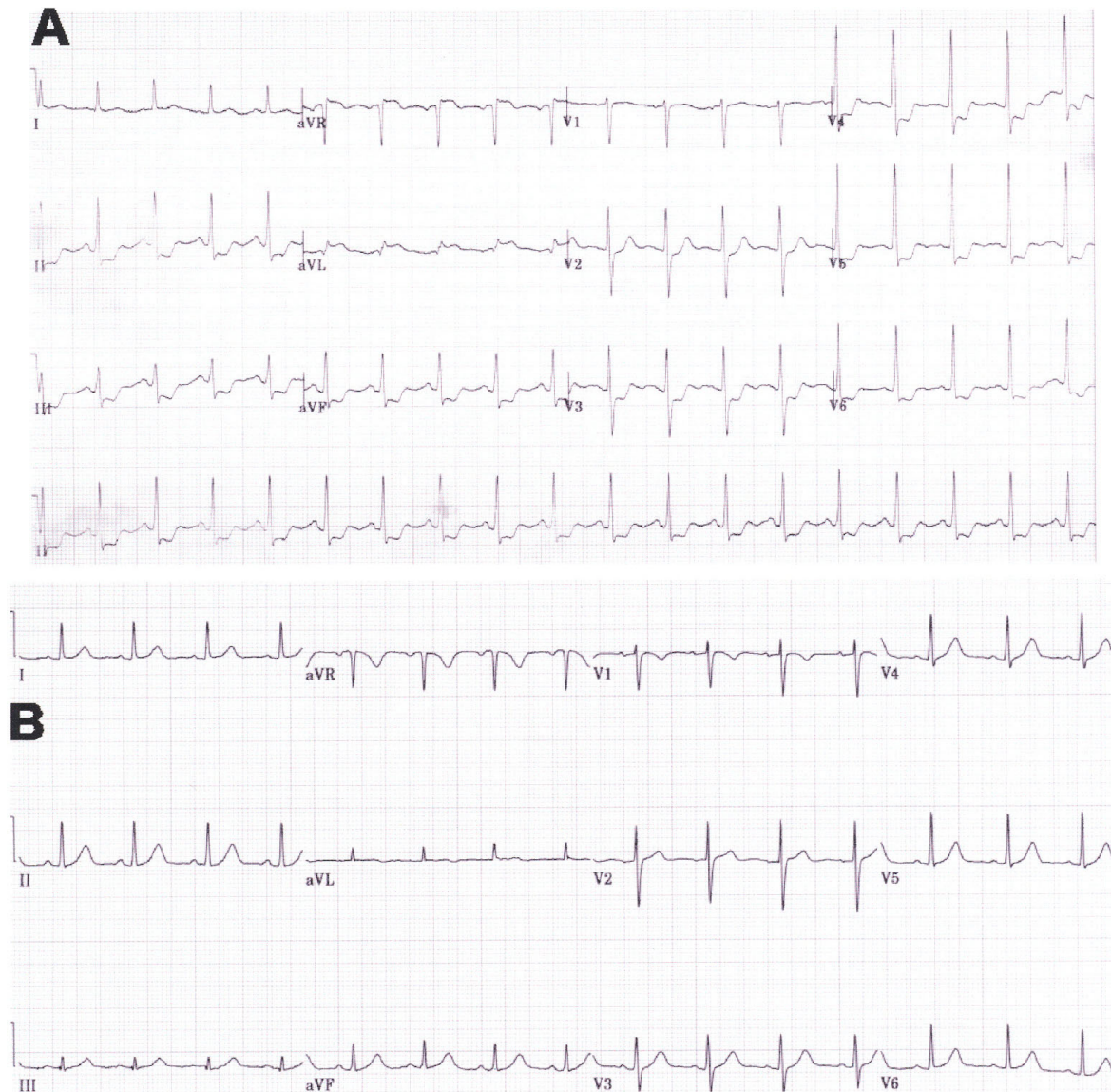
REFERENCES

1. Theoharides TC. Sudden death of a healthy college student related to ephedrine toxicity from a ma-huang containing drink. *J Clin Psychopharmacol* 1997;17:437-9 (lett).

2. Haller CA, Benowitz NL. Adverse cardiovascular and central nervous system events associated with dietary supplements containing ephedra alkaloids. *N Engl J Med* 2000; 343:1833-8.
3. Ludwig H, Genz HJ. Thrombolytic treatment during pregnancy. *Thromb Haemost* 1981; 46: 438-42.
4. Fagher B, Ahlgren M, Astedt B. Acute massive pulmonary embolism treated with streptokinase during labor and the early puerperium. *Acta Obstet Gynecol* 1990; 69:659-61.
5. Movesesian MA, Wray RB. Postpartum myocardial infarction. *Br Heart J* 1989; 62:154-6.
6. Rallings P, Exner T, Abraham R. Coronary artery vasculitis and myocardial infarction associated with antiphospholipid antibodies in pregnant woman. *Aust N Z Med* 1989; 19: 347-50.
7. Liu SS, Forrester RM, Murphy GS, Chen K, Glassenberg R. Anesthetic management of a parturient with myocardial infarction related to cocaine use. *Can J Anaesth* 1992; 39:858-61.
8. Nolan TE, Savage RW. Peripartum myocardial infarction from presumed Kawasaki's disease. *South Med J* 1990; 83:1360-1.
9. Hirabayashi Y, Saitoh K, Fukuda H, Mitsuhashi H, Shimizu R. Coronary artery spasm after ephedrine in a patient with high spinal anesthesia. *Anesthesiology* 1996; 84:221-4.

Figure 1: Electrocardiogram following injection of intravenous ephedrine in a 26 year-old female patient.

Figure 1A shows up to 3mm horizontal diffuse ST segment depression in the inferior and precordial leads during chest pain. Also note reciprocal ST segment elevation in lead aVL. Figure 1B demonstrates normal sinus rhythm and resolution of ischemic ECG changes following intravenous nitroglycerin.



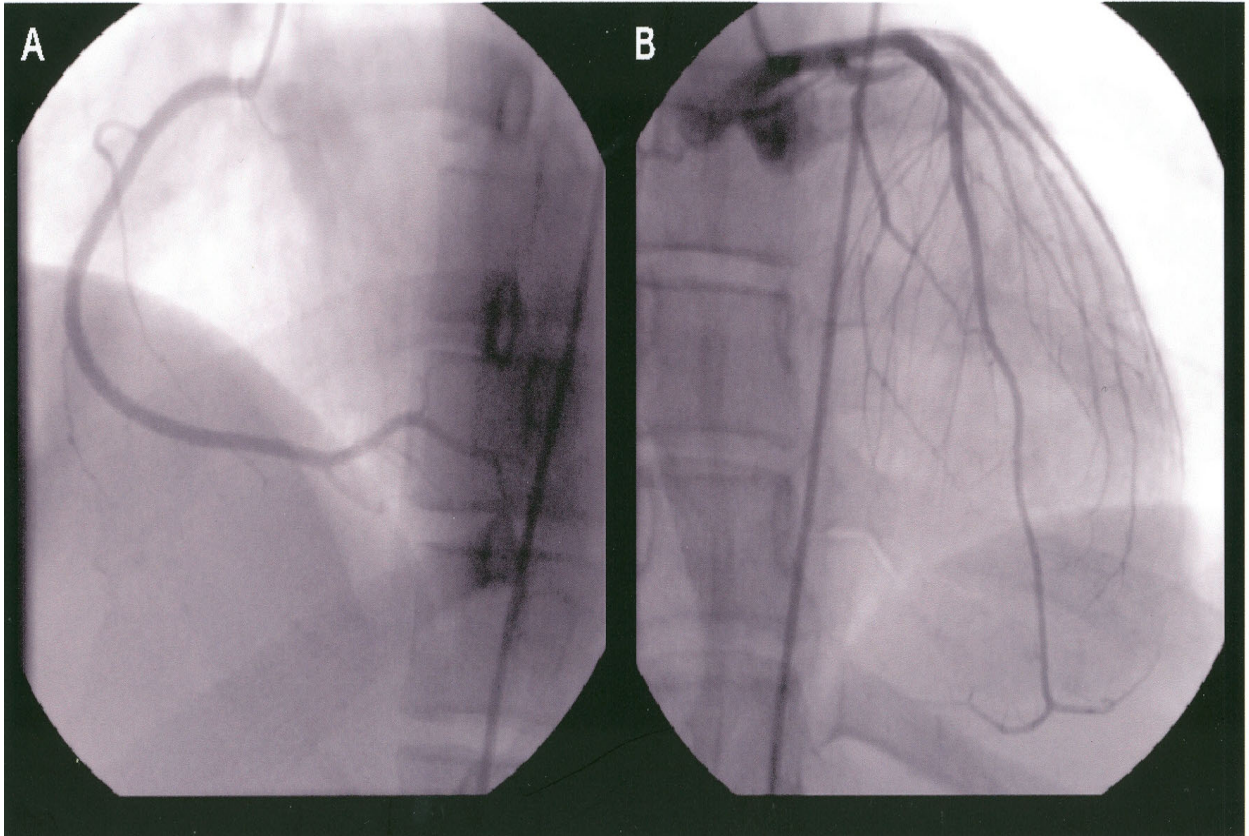


Figure 2: Coronary angiography done one day after the myocardial injury shows normal right (2A) and left (2B) coronary arteries.