Acute Myocardial Infarction Induced by Ergonovine Administration for Artificially Induced Abortion

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SUMMARY

Acute myocardial infarction after artificially induced abortion is an uncommon event because such patients are usually young females and are not usually subject to atherosclerosis. This report describes two premenopausal females who developed acute myocardial infarction after administration of ergot derivatives which were used following abortion. Coronary arteries in both cases were angiographically normal. Both patients were smokers. We concluded that the ischemic event was caused by coronary vasospasm which was precipitated by the acute administration of ergot derivatives. (Jpn Heart J 34: 803–808, 1993)

Key Words: Myocardial infarction Coronary spasm Ergot derivative Abortion Smoking

Ergonovine is well known to induce coronary artery vasospasm and it is usually used in cardiac catheterisation laboratories as a diagnostic procedure for the variant form of angina. However, this agent may precipitate acute myocardial infarction in some patients because of prolonged spasm.1) On the other hand, while ergot derivatives are frequently used after delivery or abortion in order to promote uterine contractions, serious ischemic cardiac events related to this drug have rarely been described. We report our experience with two cases of myocardial infarction induced by the post operative administration of methylergonovine maleate following artificial abortion.

CASE REPORTS

Case 1

A 38-year-old woman was admitted because of the sudden onset of severe
precordial chest pain in the early morning. She had taken 0.75 mg of methylergonovine maleate orally for 10 days after an artificial abortion. She had previously delivered two sons without any problem. Her father died of acute myocardial infarction and her oldest sister had effort angina. She smoked 20

Fig. 1. Electrocardiogram of case 1. Top: on admission. Bottom: two weeks after admission.

Fig. 2. Right coronary arteriogram of case 1 on admission before (left) and after (right) intracoronary administration of urokinase.
cigarettes and drank 70 ml of whisky daily. She was obese (+33%) and had hypercholesterolemia (total cholesterol 268 mg/dl, HDL-C 48 mg/dl). The electrocardiogram (ECG) on admission showed elevation of ST segments in leads II, III and aVF (Fig. 1, top). The blood pressure was 90/60 mmHg and the heart rate was 52/min with sinus rhythm.

Emergency angiography revealed a subtotal occlusion with thrombus of the proximal right coronary artery. After intra-coronary administration of 480,000 units of urokinase, the thrombus was lysed. A mild luminal irregularity remained (Fig. 2). The left coronary artery was angiographically normal. The maximum serum creatine-kinase (CK) during hospitalization was 376 IU and the ECG two weeks after the attack showed small q waves with inverted T waves in leads III and aVF (Fig. 1, bottom). The angiogram after 1 month did not show any significant stenosis in the right coronary artery. However, vasospasm was induced by administration of intravenous methylergonovine (0.1 mg) (Fig. 3). We concluded that her myocardial infarction was caused by the thrombus formed after prolonged spasm provoked by the oral administration of methylergonovine malate.

Case 2

A 42-year-old woman was administered 0.25 mg of methylergonovine orally after artificial abortion. She experienced an oppressive precordial sensation 4 hours after drug administration, which continued for an hour. The ECG
Fig. 4. Electrocardiogram of case 2. Top: during chest symptoms. Bottom: two weeks after admission.

Fig. 5. Coronary arteriogram of case 2 performed 4 weeks after admission. Top: vasospasm in both coronary arteries. Bottom: vasospasm disappeared after intracoronary isosorbide-dinitrate.
showed elevation of ST segments in leads II, III and aVF (Fig. 4, top). When the patient was referred to our department, the symptom had already subsided with sublingual nitroglycerin. The maximum serum CK level during hospitalization was 227 IU and the ECG two weeks after the attack showed small q waves with inverted T waves in leads II, III and aVF (Fig. 4, bottom). Coronary angiography, performed 4 weeks after the attack, demonstrated no conspicuous atheromatous obstruction, but vasospasm of both coronary arteries was induced by catheter placement at each ostium (Fig. 5). She had no coronary risk factors other than smoking 15 cigarettes daily.

**DISCUSSION**

Ergot derivatives are widely used in cardiac catheterisation laboratories to elicit coronary vasospasm in some patients who have insufficient fixed occlusive disease to explain their symptoms.\(^2\) This drug, however, may precipitate prolonged spasm in an angiographically normal coronary artery and result in iatrogenic acute myocardial infarction.\(^1\) Recently, because of its short duration of action, acetylcholine has been preferred by cardiologists as the agent for provocation of coronary vasospasm. On the other hand, in the field of obstetrics, ergot derivatives are routinely used after delivery or abortion in order to promote uterine contractions. However, despite the frequency of its usage, ischemic cardiac events related to this drug are surprisingly rare, and little attention has been given to such complications by obstetricians. Only two cases have been published to our knowledge.\(^3,4\) It is likely that postpartum myocardial infarction precipitated by ergot derivatives has been overlooked, as it is uncommon and symptoms may be vague, especially in early stages, or in patients who have had analgesics during delivery.

The difference in attitude toward this drug between cardiologists and obstetricians may be based on patient selection, that is, obstetrical patients are usually younger, premenopausal, and have fewer coronary risk factors. Although the mechanism and pathophysiology of coronary vasospasm remain unclear, smoking, alcohol and mild atherosclerosis have been postulated as underlying factors leading to easily induced coronary spasm. The two previously reported cases had migraine which is one of the clinical manifestations of an angiospastic disorder as well as being associated with coronary vasospasm.\(^5\) Although our two patients had no migraine history, they were older than the two previously reported patients. Therefore, their coronary arteries might have been susceptible to vasospasm because of intimal changes secondary to aging.

It is worth noticing that, including the present two cases, all four women were smokers. Caralis and his coworkers recently reported that smoking is the
most important risk factor for coronary spasm in premenopausal woman.\textsuperscript{6} Although the pathogenesis has not been clarified in detail, recent investigators have reported that smoking does increase platelet activity and the urinary excretion of thromboxane A$_2$, a known potent vasoconstrictor.\textsuperscript{7}

In conclusion, ergot derivatives, even in obstetrical patients, can induce coronary vasospasm resulting in acute myocardial infarction. Hence, special attention should be paid when this drug is used for obstetrical purposes, especially in smokers over age 30.

**References**


