CORONARY SPASM IN TWO SISTERS

YASUMASA FUIWARA, M.D., OSAMU YAMANAKA, M.D.
TAI NAKAMURA, M.D. AND *HIROSHI YAMAGUCHI, M.D.

Coronary spasm was observed in two sisters. Neither of them had significant atheromatous stenosis in the coronary arteries. The 41-year-old elder sister presented with resting morning angina. The stress electrocardiogram showed marked depression of the ST-segment in precordial leads. Diffuse vasospasm in the left anterior descending artery was induced by the intracoronary administration of acetylcholine. The 38-year-old younger sister suffered from acute inferior myocardial infarction after taking methylergonovine following an abortion. Emergent coronary angiography disclosed a thrombus in the proximal right coronary artery which was dissolved with intracoronary administration of urokinase. There was no residual stenosis in the culprit vessel. Although the sisters do have risk factors for coronary spasm, an inherited factor may contribute to the mechanism of the spasm.

(Rec'd Circ J 1993; 57: 472-474)

SINCE Prinzmetal and Kanname1 published their report in 1959, many cases of vasospastic or variant angina have been described, but only a few authors have reported this disorder in siblings. Although there are a few reports in male siblings2-4 no reports of sisters with coronary vasospasm have been published. We encountered two sisters in which the elder had vasospastic angina and the younger had coronary spasm resulting in myocardial infarction.

CASE REPORTS

A 41-year-old woman presented with a three-month history of rest angina in the early morning. She smoked 15 cigarettes and drank approximately 80 ml of whisky daily. Her oldest sister had an effort angina and her father died of acute myocardial infarction.

Physical examination on admission was normal. The blood pressure was 130/65, and the heart rate was 70 and regular. Although the electrocardiogram (ECG) at rest was normal, a treadmill exercise test resulted in a 2 mm downsloping ST-segment depression in leads I, II, III, aVF and V3-6. The ECG abnormality continued for 5 min after the test and was accompanied by a feeling of pressure in the chest (Fig. 1, top). Coronary angiography was performed because we suspected a significant stenosis in the coronary artery. However, there were no lesions in the coronary arteries, and the left ventriculogram was also normal. A provocative test for coronary arterial spasm was performed with a 50 μg administration of acetylcholine into the left coronary artery. Significant spasm (Fig. 2, top) was induced, especially in the left anterior descending artery, and was accompanied by typical angina and ST-
segment depression in the monitor leads (II and V₃). After intracoronary administration of isosorbide dinitrate (ISDN), the chest pain subsided along with the disappearance of the spasm.

The 38-year-old younger sister was admitted because of a sudden onset of severe precordial pain in the early morning. She had taken methylergonovine maleate for 10 days after an induced abortion. She also smoked 15 cigarettes and drank about 80 ml of whisky daily. She was obese (+30%), and had hypercholesterolemia (254 mg/dl, HDL-C 50 mg/dl). The ECG on admission showed ST-segment elevations in leads II, III and aVF (Fig.1, bottom). The blood pressure was 85/60 and the heart rate was 56 with sinus rhythm. Emergent angiography revealed sub-total occlusion of the proximal right coronary artery by a thrombus. After the intra-coronary administration of 480,000 units of urokinase, the thrombus decreased in size markedly. The maximum serum creatine-phosphokinase level was 376 IU/L. A small q-wave and inverted T-wave remained in leads II, III and aVF. Four weeks after admission, the coronary artery showed no significant atheromatous lesions, but vasospasm was induced by intra-coronary administration of acetylcholine (Fig.2 bottom). She has been asymptomatic after oral administration of diltiazem and long-acting ISDN. Both sisters had human leucocyte antigen (HLA) type BW52.

DISCUSSION

While the mechanism of coronary vasospasm is based on an increased sensitivity of the coronary arteries, its pathophysiology remains unknown. The sensitivity may be enhanced by acquired factors, such as mild coronary atherosclerosis, alcohol, cigarette smoking or ergotamine.

On the other hand, since vasospastic angina appears to occur frequently in certain geographic locations, such as Japan, Italy, and Canada, its underlying pathophysiologic abnormality may be transmitted genetically. Mauriston et al. investigated the family members of their patients with vasospastic angina. Since none had a history of angina, ergonovine provocative tests were performed. However, the results were negative in all of the subjects. The authors concluded that the vasospasticity was acquired rather than inherited. However, reports of 3 male siblings with vasospastic angina suggest a genetic transmission. Hasegawa, et al. reported a family in which the mother died suddenly after experiencing chest pain, and two brothers were shown to have vasospastic angina. A hereditary factor was thought to be involved in the pathogenesis of the coronary vasospasm.

The relationship between vasospastic angina and HLA is still controversial. The HLA
type BW52, which is frequent among patients with variant angina, was also observed in our present case. However, its etiological significance in vasospasm is unclear because the HLA type BW52 is also frequently found among normal Japanese.

To our knowledge, this is the first report of coronary spasm demonstrated angiographically in sisters. Minor atherosclerosis, smoking, or alcohol may have contributed to the pathogenesis of their spasms. In particular, methylergonovine probably contributed to the coronary event of the younger sister. However, we suspect that the appearance of coronary spasms in these sisters is more than coincidence, and that HLA BW52 or some unknown inherited factor may participate in the mechanism.

REFERENCES


Japanese Circulation Journal Vol.57, May 1993