Anticoagulant Therapy During Successful Pregnancy and Delivery in a Kawasaki Disease Patient With Coronary Aneurysm

—— A Case Report ——

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Thirty-one-year-old woman with Kawasaki disease wanted a child. She had a large coronary aneurysm on the left main coronary artery and complete obstruction of the right coronary artery, but there was no sign of ischemia. Heparin anticoagulant therapy was begun 8 weeks after the onset of pregnancy. The activated partial thromboplastin time (APTT) was successfully maintained at 1.5 to 2.0 times normal value during pregnancy and puerperium. There were no thromboembolic complications during pregnancy or after an uneventful cesarean delivery. The neonate was healthy.

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Kawasaki disease is a febrile illness of infancy and childhood, and is accompanied by cardiac involvement including vasculitis of the coronary artery! Coronary aneurysms are detected at an early convalescent stage in about 15% of the patients with Kawasaki disease, and are associated with thrombotic occlusion in some patients.

Twenty nine years have passed since the first case of Kawasaki disease was reported. Therefore, some patients who had Kawasaki disease in childhood are now adults and of childbearing age. However, there are no guidelines for pregnancy, delivery and patient care in Kawasaki disease patients with a coronary aneurysm.

We recently encountered a woman with Kawasaki disease with a coronary aneurysm who wanted a child. Careful physical examination did not contraindicate pregnancy, so she was encouraged to carry to term. She was successfully treated with heparin during pregnancy and delivery.

Case report

The patient was a 31-year-old woman. She had suffered from Kawasaki disease at 8 years of age and had a history of effort angina at 16 years of age. An aneurysm of the left coronary artery and complete occlusion of the right coronary artery were diagnosed by coronary angiography at 19 years of age. She had a history of an induced abortion at age 27 upon the recommendation of her previous physician. After moving to Tokorozawa, she came under the care of the Kawasaki disease unit in our outpatient department. Since she and her husband expressed a strong desire for a child, we reevaluated her cardiac performance. At the physical examination, her heart rate was 75 beats/min, blood pressure was 120/70 mmHg, and there had been no recent episodes of effort angina. An electrocardiogram showed no abnormal Q wave and normal sinus rhythm. A treadmill exercise tolerance test showed no ischemic change on the electrocar-
diagram at the age-related maximum target heart rate (11 METs). Coronary arteriography at 30 years of age revealed a large aneurysm on the left main coronary artery (Fig 1A) and total occlusion of the proximal right coronary artery (Fig 1B). Left ventriculography showed a reserved left ventricular function (ejection fraction=60%). We decided that the patient could tolerate pregnancy and labor without ischemic changes in the heart if she were under anticoagulant therapy during pregnancy and after delivery. We explained the risk of pregnancy and labor and obtained the written informed consent of the patient and her husband. Accordingly, anticoagulant therapy was started in the 8th week of pregnancy. To maintain an activated partial thromboplastin time (APTT) of 1.5 to 2.0 times normal value over a period of at least 8 h, 15,000 IU/day of heparin (7,500 IU bid) was administered subcutaneously in the abdomen (Fig 2).
Anticipating the possibility that there might be difficulties with abdominal subcutaneous injections during the 3rd trimester, we checked the requisite dosage of heparin needed if the subcutaneous injections were given in the thigh instead of the abdomen. In this case, we found that the heparin dosage needed to be increased by 1.3 to obtain the same value of APTT (1.5 to 2.0 times normal value; Fig 2).

During the 2nd trimester, the dose was increased to 20,000 IU/day of heparin (10,000 IU bid), administered subcutaneously in the abdomen. In the 3rd trimester, a dose of 25,000 IU/day of heparin (12,500 IU bid), administered subcutaneously in the abdomen, was required to maintain the APTT level at 1.5 to 2.0 times normal value 4 h after administration (Fig 3); thigh injections proved unnecessary.

In the 38th week of pregnancy, the patient received hourly intravenous administrations of heparin (1000 IU). Since a cesarean section delivery was planned, heparin was discontinued 2 h before the section began and resumed 4 h after delivery was completed. The cesarean section procedure required 3 h. There were no complications and a healthy neonate was delivered. Subcutaneous administration of heparin (7,500 IU bid) was continued during puerperium.

**Discussion**

Since there have been no previous reports of successful pregnancy and delivery in Kawasaki disease patients with coronary aneurysms, there are no established guidelines for care in such cases. The major basis for deciding that the patient in the present study could tolerate pregnancy and labor was that her exercise tolerance test showed no ischemic signs despite the presence of a coronary aneurysm on the left main coronary artery and complete occlusion of the right coronary artery.

It is well known that blood coagulability is accelerated in pregnant women as compared to non-pregnant women. Therefore, we decided that the patient should receive anticoagulant therapy throughout pregnancy and puerperium to prevent thrombosis in the coronary aneurysm. The dosage of heparin was determined with reference to that in a case of valve replacement. Apparently, heparin clearance is also higher in pregnant women than in non-pregnant women, and increases as pregnancy advances. Therefore, to maintain APTT at 1.5 to 2.0 times normal value throughout pregnancy, the dose of heparin had to be increased as pregnancy progressed. In the third trimester, the required dosage of heparin was 1.7 times that in the first trimester. In the present case, the patient was amenable to the therapy so that the anticoagulant control was stable and there were no thrombotic complications.

It should be noted that the dosage of heparin required to achieve a relatively stable APTT value unexpectedly varied according to the site of subcutaneous administration. In our case, administration in the thigh (which proved unnecessary) would have required a 1.3-fold increase over administration in the abdomen. The reason for this difference between injection sites is unclear.

It is safe to assume that in the future there will be more Kawasaki disease patients with coronary
aneurysms who wish to have children. To avoid unnecessary abortions and to provide more opportunities for childbearing in such patients, a set of guidelines should be developed for the care and maintenance of pregnancy and delivery for Kawasaki disease patients with coronary aneurysm.

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References


