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ST-segment elevation myocardial infarction (STEMI) due to severe anemia resulting from transient erythroblastopenia of childhood in a 2 year old boy after arterial switch operation in the absence of coronary artery stenosis

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Background:

Myocardial ischemia or infarction occurs when the oxygen demand of the myocardium exceeds its supply. Severe anemia reduces the oxygen supply of the myocardium but increases the cardiac output and may therefore cause an oxygen supply-demand mismatch. A myocardial infarction due to severe anemia in children is extremely rare.

Case report:

Arterial switch operation (ASO) was performed on a 9-days-old boy with transposition of the great arteries. The postoperative course was uneventful except for a moderate supraaortic pulmonary stenosis and consecutive right ventricular hypertrophy. Aged 1 year 9 months he presented with a history of fatigue and pallor of several days. Diagnostics revealed a severe normochromic normocytic anemia and an acute myocardial infarction. Hemoglobin was 1,7 mmol/l = 2,7 g/dl, hematocrit was 8%, cardiac troponin I was max. 0,98 ng/ml (normal < 0,04 ng/ml) and CK-MB was max. 10,5 ng/ml (normal < 6,6 ng/ml). The electrocardiogram showed ST elevation in leads aVR and V1 and ST depression in leads I, II and V4, V5 and V6. A right ventricular infarction was diagnosed. The patient responded well to erythrocyte transfusion with normalization of laboratory findings and physical condition. The recovery was uneventful. Further diagnostics suggested transient erythroblastopenia of childhood to be the cause of the anemia. Coronary angiography was normal.

Discussion:

This 2-year-old patient after ASO suffered a ST-segment elevation myocardial infarction (STEMI) due to severe anemia resulting from transient erythroblastopenia of childhood. Coronary artery stenosis as a possible cause of myocardial ischemia after ASO was ruled out. To our knowledge no similar case of myocardial infarction due to anemia has been described in children so far.