

149

BODY SURFACE MAPPING CAN DETECTS ABNORMAL REPOLARIZATION IN SEVERE CORONARY ARTERY STENOSIS DUE TO KAWASAKI DISEASE

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[Aims] To investigate electrical disturbance in coronary artery stenosis due to Kawasaki disease using body surface mapping and QT dispersion. [Methods] Fifteen patients (ten males) with severe coronary artery stenosis due to Kawasaki disease underwent coronary artery bypass graft at two to 16 years old (median 9). Using VCM3000TM (Fukuda, Japan), 87-leads ECG were recorded at rest and after injection of 0.6 mg/kg dipyridamole. Subtraction from after injection in each potentials 60 ms from J point and in tegrated QRST were defined as ST60 (mV) and sub-QRST-I-map (microVsec). Subtraction from normal control in each potential 20 and 30 ms from QRS, and integrated QRST, QRS and ST were defined as QRS20, QRS30, dep-QRST-I-map, dep-QRS-I-map and dep-ST-T-I-map. Leads under -2SD from control were counted as Da. Minimum potential in subtraction and Da were compared between before and late after the surgery. QT dispersion were calculated as the maximum minus the minimum QT interval of all leads in 87-lead ECG. We investigated relationship between QT dispersion and Da. [Results] ST 60 and sub-QRST I map increased from -0.27±0.22 and -63.8±42.8 to -0.09±0.068 and -35.9±30.9, respectively (p<0.01). Da in QRS30, dep-QRST I map and dep-ST-T I map had significant change from 16.2±13.0, 5.2±12.5, 4.1±11.3 to 6.0±5.6, 13.2±9.6, 14.5±11.7, respectively (p<0.05). Additionally QT dispersion and Da in dep-QRST-I-map, dep-ST-T I map had correlation each other (p<0.05). [Conclusion] Increment of ST60 and sub-QRST-I-map demonstrates improved ischemia. Decrement of Da in QRS30 supposes normalized myocardial potential. Although in dep-QRST-I-map and dep-ST-T-I-map increment of Da implicated abnormal ST segment. Additionally, correlation between Da in those and QTD assure the abnormal repolarization in severe coronary artery stenosis due to Kawasaki disease even after surgery. Whether such an abnormal repolarization results to arrhythmogenicity will be further investigated.

150

USEFUL METHOD OF LOW-DOSE DOBUTAMINE QUANTITATIVE GATED SPECT IN KAWASAKI DISEASE WITH SEVERE CORONARY ARTERIAL LESION

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Quantitative gated SPECT (QGS) is useful imaging for the myocardial perfusion and left ventricular function. To assess simultaneously myocardial perfusion and left ventricular contractile reserve by Low-dose Dobutamine(LDD) QGS in Kawasaki disease, we studied in 19 patients with severe coronary arterial lesions including myocardial infarction (group C, mean 15.9, 5-23 year old), and 15 patients without coronary stenotic lesion (group N, mean 10.4, 3-19 year old). Technetium-99m tetrofosmin (Tf) was injected into vein at ergometer or ATP stress, and at rest on the same day. Low-dose Dobutamine (3-5 µg/kg/min) was started after Tf injection at rest. Comparison of wall motion abnormality (WMA) by QGS and myocardial perfusion image from non-gated SPECT was obtained. In this method, the myocardial contractile reserve evaluated post-stress image and LDD image simultaneously on the myocardial perfusion evaluation in respect of stress image and resting image. Results: Left ventricular ejection fraction by post-stress QGS was 59.4±5.9% of group C, 69.6±8.1% of group N (p<0.01), and by LDD QGS was 69.3±7.9% and 78.3±9.1%, respectively (p<0.01). The diagnosis of myocardial viability in group C was 26% in the myocardial perfusion evaluation, 89% in the improvement of WMA through LDD. Nine percent disclosed palpitation, but the other side effect was not recognized in this method. Conclusions: LDD QGS is useful and safety method for the evaluation of myocardial contractile reserve in addition to the conventional myocardial perfusion image. This method improves the diagnosis of myocardial viability in kawasaki disease with myocardial infarction.

151

STRESS-REST MYOCARDIAL PERFUSION TOMOGRAPHY VALUE 7 CASES CORONARY ARTERY ABNORMALITIES OF ATYPICAL KAWASAKI DISEASE

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Objective: All-round comprehend coronary artery abnormalities of Atypical Kawasaki Disease. **Method:** Stress-rest Myocardial Perfusion Tomography (SPECT) value 7 cases atypical Kawasaki Disease after echocardiography and fever gone. Result: 6 in 7 cases had coronary artery stenosis and ischemia. 5 cases were left coronary artery, 1 cases was right. **Conclusion:** Found coronary artery ectasia was easy by echocardiography. It was difficultly to know coronary artery stenosis ischemia. If get SPECT early, special after echocardiograph had known coronary artery ectasia, Stenosis and ischemia arise rate is high, about 86%. This diagnosis is complete. It direct acute therapy and long time follow—up.

152

POTENTIALLY REVERSIBLE BRACHIAL VASODILATATION AND IMPAIRED FLOW-MEDIATED REACTIVITY IN ACUTE KAWASAKI DISEASE

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It remains to be determined the nature and period of vascular endothelial damage by a systemic vasculitis in the acute phase of Kawasaki disease (KD). To elucidate the impact of systemic vasculitis of acute KD on peripheral arterial dimension and reactivity, using high-resolution ultrasound system (Toshiba SSA 380A system with 7.5MHz linear-array transducer) vasodilative response to reactive hyperemia of brachial artery was evaluated in 23 children with acute KD (1.3±1.0 months after onset), 10 in recovery phase (10±2.6 months) and 33 age- and sex- matched control subjects (C). The reactive hyperemia was obtained by the pneumatic tourniquet inflated on the forearm to 180mmHg for 3 minutes and released. Baseline diameters of brachial artery were significantly enlarged both in acute KD (2.8±0.35mm, p<0.0001) and in recovery (2.7±0.23mm, p<0.05), compared with that in C (2.4±0.37mm). Percent of normal value for body surface area in brachial diameter, however, significantly improved in recovery than that in acute KD (113±10% vs 124±13%, p<0.05). Flow-mediated dilatation (% increase of diameter) was significantly depressed in acute KD (0.78±4.5% vs 16±5.0% in C, p<0.0001) and also improved in recovery (12±7.0%, p<0.0001). We concluded that systemic vasculitis of acute KD induces pathological peripheral vasodilatation and impairs vascular reactivity to hyperemia, which potentially improves in recovery phase.

153

ANKLE BRACHIAL INDEX IN THE PATIENTS WITH KAWASAKI DISEASE

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Purpose: Ankle Brachial Index (ABI) and Pulse wave velocity (PWV) are useful methods to evaluate the degree of atherosclerosis in adult. It is predicted that history of Kawasaki disease is one of risk factors of atherosclerosis. We examined the ABI and PWV of the patients with history of Kawasaki disease. Methods: We examined 178 patients visited our clinic between March 2001 and November 2001. 66 patients have the history of Kawasaki disease (45 male and 21 female, age 12.5±4.9 years, mean ±/ sd). 31 patients had had coronary abnormalities now or previously (14.4±5.0 years). 35 patients had no coronary abnormalities (10.9±4.3 years). 117 patients as a control group have arrhythmia, small VSD and others (51 male and 66 female, 12.5±3.9 years). ABI and PWV were measured automatically using form PWV/ABI (Colin Co. Aichi, Japan). Statistic analysis was performed a logistic regression to compare two groups respectively. Results: The ABI value of the patients with history of Kawasaki (1.05±0.11) was lower than control groups (1.08±0.11, p<0.05). The PWV value of the patients with history of Kawasaki (1223±268) was higher than control groups (1111±183, p<0.01). There were no significantly differences about PWV between the patients of history of Kawasaki disease with and without coronary abnormality. But the ABI value of the patients with history of coronary abnormality (1.00±0.10) was lower than the patients without history of coronary abnormality (1.09±0.11, p<0.05). Conclusion: The patients had low ABI and high PWV values indicate some atherosclerotic changes in the some arteries. The patients of history of Kawasaki disease had low ABI value and high PWV value. This might suggest that the patients of history of Kawasaki, especially the patients with history of coronary abnormality had atherosclerotic changes in some arteries.

154

FOLLOW UP FINDINGS OF DIPYRIDAMOLE STRESS ^{99m}Tc-TETROFOSMIN SCINTIGRAPHY IN PATIENTS WITH KAWASAKI DISEASE

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Some types of coronary aneurysms resulting from Kawasaki disease may regress, but some take a malignant course, leading to stenotic and obstructive lesions. It is sometimes difficult to monitor progressive changes from aneurysm to stenotic lesions because coronary angiography (CAG) cannot be repeated very often. From November 1994 through December 2000, we procedure the dipyridamole stress ^{99m}Tc-tetrofosmin (Tf) single photon emission computed tomography (SPECT) for 70 patients to 105 times. Twenty patients were followed with Tf-SPECT at least 1 year. Extent and severity scores were calculated. CAG was performed all within 3 month of Tf-SPECT. These 20 patients were divided into two groups. Group I, to 9 consisted of patients with persistent coronary stenosis, including one patient with the progression of the coronary stenosis from previous coronary aneurysm and one patient who had coronary artery bypass graft surgery (CABG). Group II, to 11 patients with persistent coronary aneurysm. In Group I, seven patients revealed ischemic findings at any stage. One patient who had progression of the coronary stenosis from coronary aneurysm did not reveal ischemic change in the aneurysmal stage, but stenotic stage revealed ischemic findings. The other patient, who had coronary artery bypass graft surgery, pre- CABG finding of Tf-SPECT revealed ischemic change but disappear ischemic finding after CABG. In Group II, they did not reveal ischemic findings. One patient who progress coronary stenosis, Tf-SPECT findings and severity score progress to accompany with coronary stenosis. This noninvasive technique may become one of the most useful method to monitor progressive changes of myocardial ischemia in Kawasaki disease.