Measurement of Flow mediated vasodilatation in Patients with a History of Kawasaki disease

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Background: It is well known that some patients with a history of Kawasaki disease (KD) with persistent coronary artery lesions (CAL) develop post-inflammatory arteriosclerosis, wherein the lesions consist mainly of hyalinized fibrous tissue, and that calcification is usually observed in some of these patients with massive aneurysms. The mechanism of calcification in the coronary arteries of KD patients is not well understood. In terms of the temporal sequence, however, the basic cause is believed to be functional damage to vascular endothelial cells, which undergo organic changes resulting in the formation of sclerotic lesions through the involvement of inflammatory mechanisms or oxidative stress; eventually, calcium deposition occurs at these sites. In order to prevent the development of calcification, which is regarded as a risk factor for coronary vessel events, it would be more appropriate to initiate treatment at the stage of functional damage. Therefore, the focus on detecting functional damage to endothelial cells has increased. The flow-mediated vasodilatation (FMD) method, which utilizes reactive hyperemia induced by the release of vascular endothelial nitric oxide, has received increasing attention in recent years due to its sensitivity. In the present study, by using FMD, we investigated the vascular functional damage in patients with KD.

Methods: We included 31 patients with a history of KD. Eleven patients wereCAL(–) and 20 were CAL(+); of the 20 CAL(+) patients, 7 were negative and 13 were positive for calcification on multi-detector computed tomography (MDCT). We performed FMD by using a UNEX testing device (UNEX Corporation, Japan).

Results: FMD values were significantly lower in CAL(+) patients compared with CAL(–) patients (p = 0.0001). Among the CAL(+) patients, FMD values were significantly lower in those who were positive compared with those who were negative for calcification (p = 0.0027). No medication that may have affected the results of FMD was identified.

Conclusion: Our study suggested that FMD measurements may predict the development of arteriosclerosis and the appearance of coronary artery calcification in patients with a history of KD. Thus, FMD may provide an important means of assessing changes in coronary artery damage over time in KD.