

## Impact of stress myocardial blood flow as an important predictor for major adverse cardiac and cerebrovascular event in hemodialysis patients, even in patients without myocardial perfusion abnormality

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**Background:** In the clinical setting, ischemic heart disease (IHD) is a major problem not only in general patients but also in regular hemodialysis (HD) patients. Positron emission tomography (PET) is becoming a reliable modality for detecting coronary artery disease. Of course, PET illustrates myocardial perfusion (MP), PET also measures myocardial blood flow (MBF) directly. We have reported stress MBF is an independent predictor in HD population. Although some prior studies show CFR is an independent predictor for their prognosis in patients without MP abnormality, there is limited data about the predictability of stress MBF in HD patients without MP abnormality.

**Methods:** A total 438 of HD patients who undergone 13NH3PET for suspected IHD were enrolled. All patients were undergone 13NH3PET at Nagoya Radiological Diagnosis Foundation. After we excluded patients whose summed stress score (SSS) <4, we identified 182 eligible patients. Patients were divided into two group according to the median value of CFR levels; low stress MBF group ( $\leq 2.56$ ) and high stress MBF group ( $> 2.56$ ). We followed up them up to 4.2 years (median 2.4 years) and collected their data. We evaluated their major adverse cardiac cerebrovascular event. We

performed Kaplan-Meier analysis and multivariable cox regression models. Furthermore, we evaluated the incremental value with C-index, net reclassification improvement (NRI) and integrated discrimination improvement (IDI) when CFR added into a model with established risk factors.

**Result:** There were intergroup difference in baseline characteristics: age, gender, prior CVD and diabetes. Kaplan-Meier analysis shows statistically intergroup difference [log rank  $p=0.013$ , hazard ratio (HR) 0.413, 95% confidential interval (CI) 0.220–0.775]. Multivariable cox regression model for MACCE shows CFR is an independent risk factor ( $p=0.004$ , HR 0.311, 95% CI 0.137–0.684). As regarding model discrimination, all of C-index (0.832 vs 0.796,  $p=0.15$ ), NRI (0.513,  $p=0.008$ ) and IDI (0.032,  $p=0.033$ ) were greatest in a predicting model with established risk factors plus stress MBF.

**Conclusion:** The low stress MBF group has poor prognosis in MACCE comparing to the high stress MBF group. Stress MBF is an independent risk factor for MACCE. Adding stress MBF on conventional risk factors could more accurately predict MACCE in HD patients, even in patients without MP abnormality.

