

## Importance of renal function on prognostic value of cardiac iodine-123 metaiodobenzylguanidine scintigraphy

Tatsuhiko FURUHASHI and Masao MOROI

*Division of Cardiovascular Medicine, Toho University Ohashi Medical Center*

**Objective:** Cardiac iodine-123 metaiodobenzylguanidine (MIBG) can be used to evaluate cardiac sympathetic nerve function and is useful for assessing the prognosis of patients with heart disease. Renal impairment in heart failure patients has been recognized as an independent risk factor for morbidity and mortality, and has been observed as abnormal uptake and washout of cardiac MIBG imaging. The purpose of this study was to evaluate the prognostic value of cardiac MIBG imaging in heart disease patients with a glomerular filtration rate (GFR) either  $\geq 60$  ml/min/1.73 m<sup>2</sup> or  $< 60$  ml/min/1.73 m<sup>2</sup>. **Methods:** Heart disease patients (n: 135, male/female: 87/48, mean age: 63 years, coronary artery disease/dilated cardiomyopathy/myocarditis: 41/62/32, mean left ventricular ejection fraction: 51%, GFR  $\geq 60$  ml/min/1.73 m<sup>2</sup> / GFR  $< 60$  ml/min/1.73 m<sup>2</sup>: 103/32) underwent cardiac MIBG imaging and were followed-up for 2.7 years. GFR was calculated by the Modification of Diet in Renal Disease (MDRD) equation. Cardiac MIBG imaging was obtained 15 min and 4 h after isotope injection. The parameters analyzed for cardiac MIBG imaging were the heart-to-mediastinum ratio (H/M) on the delayed planar image and the cardiac washout rate. **Results:** Cardiac death was observed in 9 of 103 patients (9%) with a GFR  $\geq 60$  ml/min/1.73 m<sup>2</sup> and in 6 of 32 patients (19%) with a GFR  $< 60$  ml/min/1.73 m<sup>2</sup>. The mortality ratio tended to be higher in patients with a GFR  $< 60$  ml/min/1.73 m<sup>2</sup> than in patients with a GFR  $\geq 60$  ml/min/1.73 m<sup>2</sup> ( $p = 0.10$  with Kaplan-Meier survival curves). In patients with a GFR  $\geq 60$  ml/min/1.73 m<sup>2</sup>, Cox regression analysis showed that a delayed H/M  $< 146\%$  was the most powerful predictor for cardiac death (Hazard ratio: 6.9,  $p = 0.014$ ). However, in patients with a GFR  $< 60$  ml/min/1.73 m<sup>2</sup>, the utility of cardiac MIBG imaging could not be proved. **Conclusions:** A delayed H/M is a powerful predictor of cardiac death if the GFR is 60 ml/min/1.73 m<sup>2</sup> or more.

**Key words:** cardiac death, cardiac sympathetic nerve function, coronary artery disease, dilated cardiomyopathy, predictors