

## Evaluation of coronary blood flow reserve by $^{13}\text{N-NH}_3$ positron emission computed tomography (PET) with dipyridamole in the treatment of hypertension with the ACE inhibitor (Cilazapril)

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**Purpose:** The purpose of this study was to evaluate the effect of treatment with an angiotensin-converting enzyme (ACE) inhibitor (Cilazapril) for early hypertensive patients in terms of coronary blood flow reserve evaluated by  $^{13}\text{NH}_3$ -positron emission tomography (PET).

**Methods:** Before and after 12 weeks of ACE inhibitor treatment,  $^{13}\text{NH}_3$ -PET with dipyridamole provocation test was performed, and definite myocardial perfusion and coronary flow reserve (CFR) were calculated.

**Results:** Compared to our normal subjects previously reported ( $2.61 \pm 0.74$ ), average coronary flow reserve was decreased ( $1.70 \pm 0.64$  in hypertensive patients), and improved after treatment ( $1.77 \pm 0.52$ ), but not significantly. Of 12 patients, five (42%) showed improved coronary flow reserve from 1.34 to 1.99 without a significant change in the resting flow. Only one patient (8%) showed deterioration after the ACE inhibitor treatment. The coronary vascular resistance (CVR) after ACE inhibitor treatment of the patients with  $\text{CFR} < 2.0$  decreased significantly compared with those with  $\text{CFR} \geq 2.0$  ( $p < 0.03$ ).

**Conclusions:** These results indicate that hypertensive patients at the early stage show decreased coronary flow reserve despite having normal resting flow. Treatment with an ACE inhibitor (Cilazapril) for 12 weeks improved coronary flow reserve in 42% of our patients. The CVR of the patients with  $\text{CFR} < 2.0$  showed improvement compared to those with  $\text{CFR} \geq 2.0$ .

This result indicates that an ACE inhibitor (e.g., Cilazapril) should be one of the choices for improving CFR if hypertensive patients in early stage show signs of ischemia or diastolic dysfunction, which may be one of the sequels of reserve restriction.

**Key words:** coronary flow reserve, angiotensin-converting enzyme inhibitor, positron emission computed tomography, hypertension, cilazapril