

Metabolic reserve in normal myocardium assessed by positron emission tomography with C-11 palmitate

Nagara TAMAKI,* Masahide KAWAMOTO,* Norio TAKAHASHI,* Yoshiharu YONEKURA,*
Yasuhiro MAGATA,* Ryuji NOHARA,** Hirofumi KAMBARA,** Chuichi KAWAI**
and Junji KONISHI**

**Department of Nuclear Medicine, **Third Division, Department of Internal Medicine,
Kyoto University Faculty of Medicine, Japan*

Positron emission tomography (PET) with C-11 palmitate has been used in estimating the myocardial utilization of free fatty acid. To assess the metabolic reserve in normal subjects, a PET study was performed at control and during dobutamine infusion at 2 hour intervals in 5 normal subjects. Following monoexponential curve fitting of the time activity curve of the myocardium, the clearance half time (min) and residual fraction (%) were calculated as indices of β -oxydation of free fatty acid. A significant increase in the heart rate and systolic blood pressure were observed during dobutamine infusion (65 ± 5 vs 100 ± 29 bpm, $p < 0.05$ and 119 ± 12 vs 144 ± 16 mmHg, $p < 0.01$, respectively). The clearance half time and the residual fraction were significantly decreased (23.4 ± 2.6 vs 15.8 ± 2.3 min and 67.0 ± 2.5 vs $58.6 \pm 4.0\%$, $p < 0.05$, each). When the left ventricular myocardium was divided into 4 segments, these indices were similar at control and uniformly decreased without regional differences during dobutamine infusion. These data suggest that β -oxydation of free fatty acid may be uniformly increased in the left ventricular myocardium in relation to the increase in cardiac work in normal subjects. PET with C-11 palmitate at control and during dobutamine infusion is considered to be promising in assessing metabolic reserve in the myocardium.

Key words: emission computed tomography, C-11 palmitate, fatty acid metabolism, dobutamine