

## Summary

### Study on the Accuracy of Regional Cerebral Blood Flow Measurement Using *N*-Isopropyl-*p*-[<sup>123</sup>I]Iodoamphetamine: Effects of Differences in Venous Sampling Site and Static Imaging Direction in One-Point Venous Sampling Method Based on the Causality Model

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**Purpose:** We have previously reported the method of regional cerebral blood flow measurement using *N*-isopropyl-*p*-[<sup>123</sup>I]iodoamphetamine, in which the input function into brain was estimated from one-point venous blood sampling value based on the method of causality analysis between input and output functions. In the present study, we examined the effects of differences in blood sampling site and direction of static image collection on the accuracy of estimating input function using this method.

**Methods:** The subjects consisted of 50 patients of right forearm venous sampling and 50 patients of left forearm venous sampling. As the static imaging directions, the following four combinations were compared all four directions, anterior and posterior directions, right and left directions, and an anterior direction. The accuracy of measurement was evaluated by comparing the estimated and directly measured value of input/output function (Ca<sub>oct</sub>/C<sub>v<sub>oct</sub></sub>), and by the error indices and the correlation coef-

ficients between the estimated and directly measured value.

**Result:** In both groups of venous sampling, there was no significant difference between the estimated and directly measured value of Ca<sub>oct</sub>/C<sub>v<sub>oct</sub></sub>. The error indices and correlation coefficient showed no significant difference between the right and left venous sampling groups. Similarly, no significant influence on Ca<sub>oct</sub>/C<sub>v<sub>oct</sub></sub> value was observed by the difference of static imaging direction. Finally, the rCBF values calculated using these estimations were not significantly different from those by continuous arterial sampling method.

**Conclusions:** These results indicate that both the difference in venous sampling site and the static imaging direction have little effect on the accuracy in our new method of rCBF measurement, and suggest its clinical versatility.

**Key words:** Regional cerebral blood flow, <sup>123</sup>I-IMP SPECT, Venous sampling, Causality model.