

Summary

Measurements of Cerebral Blood Flow by the Noninvasive Microsphere Method with ^{123}I -IMP and Fan Beam Collimator: Comparison with the Continuous Arterial Blood Sampling Method

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[Purpose and Methods] The noninvasive microsphere (NIMS) method quantifies cerebral blood flow with N-isopropyl-p- ^{123}I iodoamphetamine (^{123}I -IMP) without blood sampling of a patient, but when a fan beam collimator is used for collecting raw data in single photon emission computed tomography (SPECT), the procedure is complicated because we have to change the collimator. In phantom and clinical studies we investigated the validity of using a fan beam collimator in collecting planar and SPECT raw data. **[Results]** The phantom study suggested that using a fan beam collimator for planar imaging was feasible because of the image magnification rate and the count rate. Mean cerebral blood flow (mCBF) values

obtained by the NIMS method with the fan beam collimator were compared with mCBF simultaneously estimated from the conventional continuous arterial blood sampling (microsphere: MS) method in twenty patients with ischemic cerebral vascular diseases. There was good correlation ($y = 1.033x + 8.004$, $r^2 = 0.729$, $p < 0.01$) in mCBF between the fan beam NIMS method and the MS method. **[Conclusion]** In conclusion, this method for the measurement of CBF was acceptable for routine clinical studies.

Key words: N-isopropyl-p- ^{123}I iodoamphetamine, SPECT, Cerebral blood flow, Noninvasive microsphere method (NIMS), Fan beam collimator.