ORIGINAL ARTICLE

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Brain and whole body distribution of *N*-isopropyl-4-iodoamphetamine (I-123) in humans: Comparison of radiopharmaceuticals marketed by different companies in Japan

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Objective: Iodine-123 (^{123}I)-labeled *N*-isopropyl-4-iodoamphetamine (IMP) has been used as a cerebral blood flow (CBF) tracer for single-photon emission computed tomography (SPECT). An autoradiographic (ARG) method has been developed for the quantitation of CBF by IMP and SPECT. Two IMPs (IMP_A and IMP_B) produced by different radiopharmaceutical companies are marketed in Japan. In the present study, whole-body distributions including brain and blood of the two IMPs were compared in the same human subjects. ***Methods:*** Two brain SPECT studies using IMP_A or IMP_B were performed on separate days in six young healthy men. Whole-body scans were also obtained with a large field-of-view single-head gamma camera. One-point arterial blood sampling was performed at 10 min after injection of IMP to measure both the radioactivity concentrations of whole blood and of octanol-extracted components. ***Results:*** No significant differences between the two tracers were observed in body distribution, tracer kinetics in brain, or regional distribution in brain. However, the octanol extraction fraction in blood was significantly different between the two tracers. Radiochemical purity was slightly but significantly different between the tracers. ***Conclusions:*** In the ARG method, arterial input function is determined by calibration of a standard input function with the radioactivity concentration of arterial whole blood. Because the standard input function in the ARG method was obtained using IMP_A, the standard input function obtained for IMP_B should be used when CBF is calculated by the ARG method with IMP_B.

Key words: IMP, SPECT, CBF, ARG method