Favorable biodistribution of $^{99m}$Tc-ECD for brain SPECT comparing with $^{123}$I-IMP using alternative body scan

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In order to evaluate the lung and brain uptake of $^{99m}$Tc ethyl cysteinate dimer ($^{99m}$Tc-ECD) and N-isopropyl-p-[$^{123}$I]-iodoamphetamine ($^{123}$I-IMP), alternative body scans were carried out in 15 cases of cerebrovascular disease. The biodistribution of $^{99m}$Tc-ECD was 5.5±0.7%, 3.8±0.7% in the brain; 13.1±3.7%, 2.2±1.2% in the lung at 15 min and at 4 hours, respectively, whereas that of $^{123}$I-IMP was 3.9±1.4%, 5.0±1.0% in the brain; 32.2±7.6%, 12.7±3.3% in the lung at 15 min and at 4 hours, respectively. $^{99m}$Tc-ECD accumulated in comparatively high amounts in the brain but remained low in the lung in the early image compared to $^{123}$I-IMP. However there was a high inverse correlation between brain and lung uptake of $^{123}$I-IMP (r = −0.82), but not of $^{99m}$Tc-ECD (r = −0.18).

We concluded that $^{99m}$Tc-ECD had a better biodistribution in terms of low lung accumulation than $^{123}$I-IMP in brain SPECT.

Key words: $^{99m}$Tc-ECD, $^{123}$I-IMP, lung uptake, brain uptake